

POOR LEGIBILITY

ONE OR MORE PAGES IN THIS DOCUMENT ARE DIFFICULT TO READ
DUE TO THE QUALITY OF THE ORIGINAL

33060

SFUND RECORDS CTR
2102657

PRELIMINARY INVESTIGATION
OF THE RAILSPUR
CHEMONICS INDUSTRIES
734 E. SOUTHERN PACIFIC DRIVE
PHOENIX, ARIZONA 85036

Prepared for:

LEWIS AND ROCA
40 North Central Avenue
Phoenix, Arizona 85004

Prepared by:

THE EARTH TECHNOLOGY CORPORATION
2411 West 14th Street,
Suite 210
Tempe, Arizona 85281

November 1990

MS 03275

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1-1
1.1 BACKGROUND	1-1
1.2 OBJECTIVE	1-3
2.0 RAIL SPUR INVESTIGATION	2-1
2.1 SAMPLING METHODOLOGY AND PROCEDURES	2-1
2.2 REQUEST FOR ANALYSIS AND ANALYTICAL RESULTS ...	2-1
3.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS	3-1
4.0 LIMITATIONS	4-1
APPENDIX A - FINAL REPORT OF THE CAPITOL ENGINEERING PROPERTIES AT 724 EAST SOUTHERN PACIFIC DRIVE AND 415, 419 SOUTH SEVENTH STREET, PHOENIX, ARIZONA, SUBMITTED TO ADEQ BY WATER RESOURCES ASSOCIATES ON JUNE 9, 1990	
APPENDIX B - SOIL SAMPLING PLAN, 734 EAST SOUTHERN PACIFIC DRIVE, PHOENIX, ARIZONA	
APPENDIX C - LABORATORY ANALYTICAL RESULTS	

TABLE OF CONTENTS
(Contents)

LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
1-1.	Site Location, 734 East Southern Pacific Drive, Phoenix, Arizona	1-2
2-1.	Sample Locations, Chemonics Industries, 734 East Southern Pacific Drive, Phoenix, Arizona	2-2

LIST OF TABLES

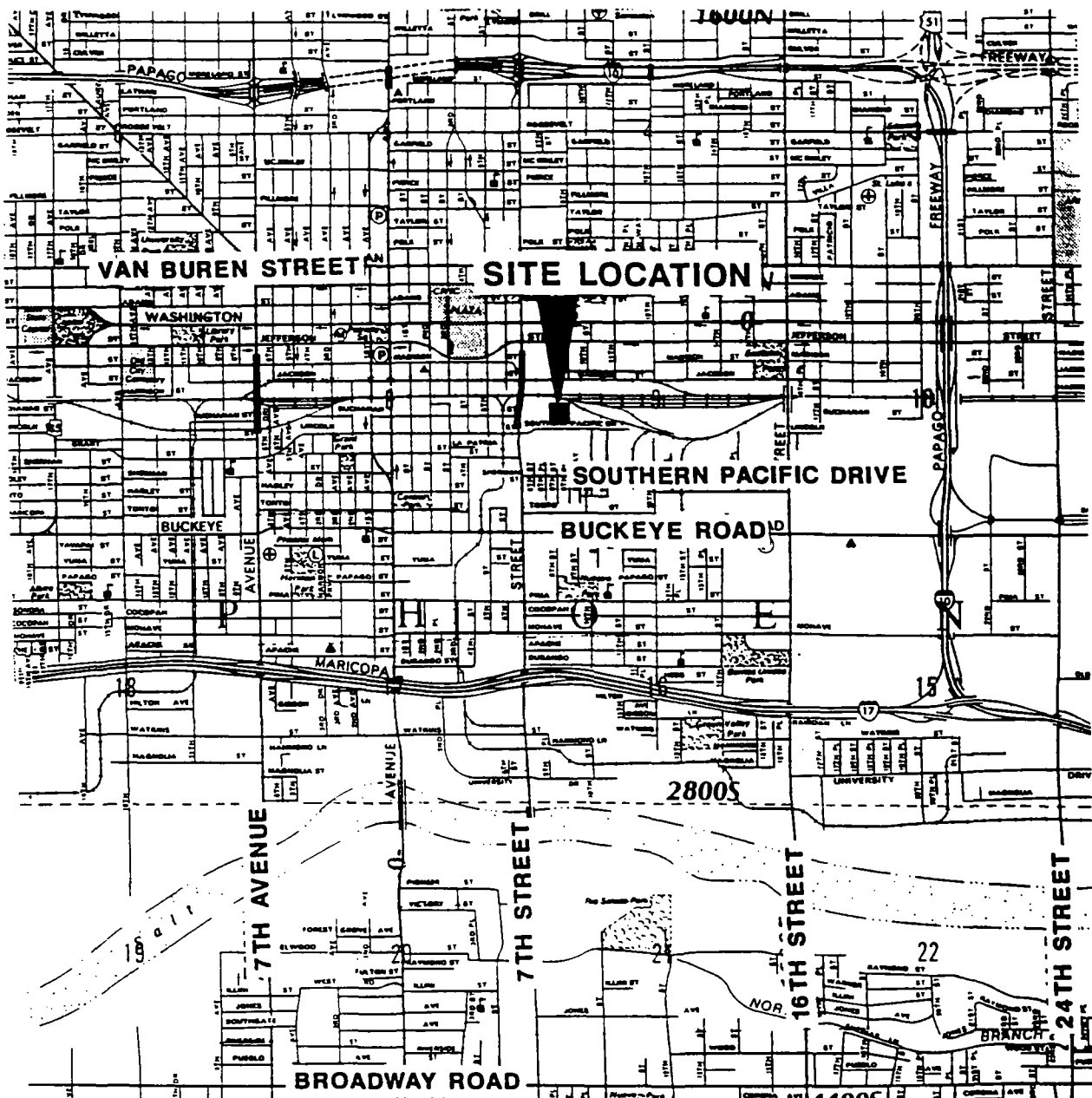
<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
2-1.	Summary of Analytical Results, Organochlorine Pesticides and PCBS	2-3

1.0 INTRODUCTION

1.1 BACKGROUND

The Earth Technology Corporation (Earth Technology) was retained by Lewis and Roca and Chemonics Industries, Inc. (Chemonics) to perform a soil sampling investigation of the railroad spur located adjacent to the northern property boundary of the Chemonics facility. The Chemonics facility is located at 734 E. Southern Pacific Drive, Phoenix, Arizona (Figure 1-1). The site consists of approximately 4.5 fenced acres and is bounded by Southern Pacific Drive on the south and the Southern Pacific Railroad tracks on the north. Capitol Engineering is located to west, at 724 E. Southern Pacific Drive. The area to the east appears to be used for truck parking and railroad car unloading and switching. Chemonics and other companies have been at the facility since 1938. Historic and current activities at the site have included blending and storage of insecticides, fertilizers, and fire retardants, chemical storage and packaging, metals reclaiming, cabinet fabrication, metal work, and vehicle assembly.

Capitol Engineering, located adjacent to the subject facility, contracted Water Resources Associates, Inc. (WRA) to conduct an environmental assessment and site inspection of the Capitol Engineering properties. Two soil samples collected in the railroad spur area during WRA's investigation indicated the presence of polychlorinated biphenyls (PCBs) and organochlorine pesticides (DDT, DDE). WRA submitted a report to the Arizona Department of Environmental Quality (ADEQ) on June 9, 1989 entitled "Final Report of the Capitol Engineering Properties at 724 East Southern Pacific Drive and 415, 419 South 7th Street, Phoenix, Arizona" (Appendix A). In this report, WRA recommended that additional investigation be conducted in upgradient areas including the railroad yard, railroad spur and Chemonics.



Source: Wide World of Maps, 1990
 Reproduced by permission #900222-A



SCALE IN MILES

The Earth Technology Corporation

Project No: 90-621
 Chemonics Industries

SITE LOCATION
 734 EAST SOUTHERN PACIFIC DRIVE
 PHOENIX, ARIZONA

Figure 1-1

10-90

1.2 OBJECTIVES

The primary objective of the soil sampling investigative was to assess the presence of organochlorine pesticides and PCBs in the railroad spur adjacent to the northern perimeter of the subject property. To accomplish this objective, a Soil Sampling Plan was prepared and implemented in accordance with the guidelines provided in the ADEQ Quality Assurance Project Plan (QAPP), dated December 1989. The sampling plan, provided in Appendix B, discusses (1) the rationale used to determine the locations, depths, and numbers of samples; (2) relationship between sample locations and suspected areas of contamination; (3) analyses to be performed; (4) sample collection and preservation procedures; (5) Quality Assurance/Quality Control (QA/QC) methods and procedures; and (6) a Site Safety Plan.

The results of the soil sampling investigation and Earth Technology's conclusions and recommendations regarding potential contamination in the rail spur area are discussed in the following sections. Laboratory analytical reports are presented in Appendix C.

2.0 RAIL SPUR INVESTIGATION

2.1 SAMPLING METHODOLOGY AND PROCEDURES

On June 6, 1990, a total of 13 soil samples were collected at 7 separate locations along the rail spur adjacent to the subject property. Soil sample locations shown on Figure 2-1 were selected based on previous sampling conducted at adjacent facilities and historical property use. Soil samples were collected at depth intervals of 0 to 0.5 feet, 1 to 1.5 feet, and 2 to 2.5 feet at sample locations CI-1, CI-2, and CI-3. The sample intervals selected at these locations are consistent with previous sampling conducted in the rail spur area. Additionally, 4 soil samples (CI-4, CI-5, CI-6, and CI-7) were collected from 0 to 0.5 feet along the eastern portion of the rail.

All soil samples were collected using a stainless-steel hand auger with a 3-inch diameter core barrel. The samples were collected in accordance with the methods and procedures described in the Sample Plan presented in Appendix B and sampling equipment was thoroughly decontaminated between sampling events at each location. All samples were labeled, sealed, placed on ice and transported to the laboratory following standard chain-of-custody procedures.

2.2 REQUEST FOR ANALYSIS AND ANALYTICAL RESULTS

Thirteen samples collected at 7 sample locations (CI-1 through CI-7) along the rail spur were analyzed for organochlorine pesticides and PCBs using EPA Method 8080. Compounds detected in the analyses of the 13 samples are summarized in Table 2-1. Laboratory analytical reports are provided in Appendix C.

During 1990, ADEQ in conjunction with ADHS, developed ingestion health-based guidance levels (I-HBGLs) through a risk assessment approach that is based on an average daily ingestion of soil over a 70 year lifetime. The average soil ingestion values suggested by

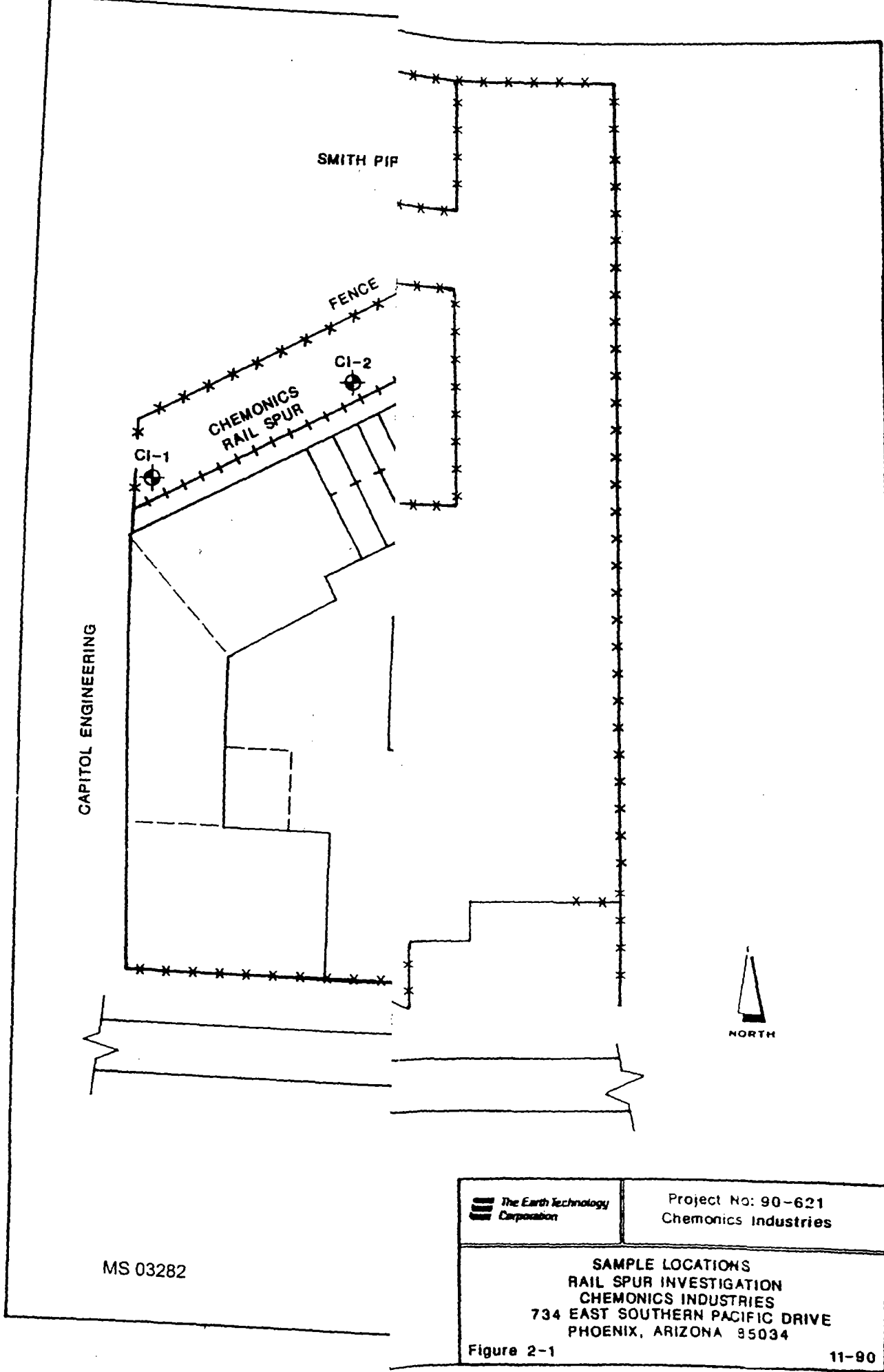


Table 2-1. Summary of Compounds Detected by Analysis
for Organochlorine Pesticides and PCBs
(EPA Method 8080)

Sample No.	Depth Interval (feet)	Analytical Results (mg/kg)(a)						
		Alpha BHC	Beta BHC	Gamma BHC	Delta BHC	DDT/DDE/DDD	Dieldrin	Toxaphene
CI-1-1	0 - 0.5	78	16	43	40	1291	<20(b)	<200
CI-1-2	1 - 1.5	5.4	0.47	13	3.2	3.7	<1.0	<10
CI-1-3	2 - 2.5	0.12	<0.05	0.28	0.22	<0.1	<0.1	<1.0
CI-2-1	0 - 0.5	<1.0	1.1	<1.0	<1.0	26	<2.0	<20
CI-2-2	1 - 1.5	0.0064	0.027	<0.005	<0.005	0.016	<0.01	<0.1
CI-2-3	2 - 2.5	<0.005	0.0065	<0.005	<0.005	<0.01	<0.01	<0.1
CI-3-1	0 - 0.5	<0.025	0.041	<0.025	<0.025	0.44	<0.05	0.99
CI-3-2	1 - 1.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.1
CI-3-3	2 - 2.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.1
CI-4	0 - 0.5	<2.5	<2.5	<2.5	<2.5	82	7	130
CI-5	0 - 0.5	<0.5	<0.5	<0.5	<0.5	10.3	<1.0	10
CI-6	0 - 0.5	<0.5	<0.5	<0.5	<0.5	15.9	<1.0	13
CI-7	0 - 0.5	<1.0	<1.0	<1.0	<1.0	40.3	<2.0	<20
I-HBGL(c)		NE(d)	NE	NE	NE	2	0.02	0.6

Note: (a) mg/kg = milligrams per kilogram

(b) <0.01 = Not Detected at the Specified Laboratory Detection Limit

(c) I-HBGL = Arizona Department of Environmental Quality (ADEQ) proposed 1990 Ingestion Health-Guidance Levels for Soil

(d) NE = Not Established

the U.S. Environmental Protection Agency (EPA) of 0.2 grams per day for children 1 to 6 years old and 0.1 grams per day for ages 7 to 70 years were used to develop the I-HBGLs.

The I-HBGLs were calculated to result in a life time exposure equivalent to that resulting from ingestion of 2 liters of water per day containing the contaminant at drinking water HBGLs or maximum contaminant levels (MCLs). These ingestion rates were used in the development of the 1990 I-HBGLs and are more representative of conditions that would be expected to be encountered in the field at most sites. For substances considered by EPA to be carcinogenic, the HBGL values were derived by calculating the concentration that would result in an excess cancer risk below one in one million. The use of a consistent methodology for determining the I-HBGLs led in a few cases to results that are not physically possible (i.e., I-HBGL below laboratory detection limit). In these cases, ADEQ suggests that the laboratory detection limit should be used as guidance. ADEQ's proposed 1990 I-HBGLs are included in Table 2-1 for comparison with the analytical results.

The analytical results indicate the presence of certain pesticides along the length of the rail spur. Pesticides detected include alpha, beta, gamma, and delta BHC, DDT/DDD/DDE, Dieldrin, and Toxaphene. Other organochlorine pesticides and polychlorinated biphenyls (PCBs) included in the EPA Method 8080 were not detected above laboratory detection limits.

The concentrations of DDT/DDD/DDE in the samples collected from 0 to 0.5 feet range from a high of 1,291 milligrams per kilogram (mg/kg) in sample CI-1-1 to a low of 0.44 mg/kg in sample CI-3-1. All samples collected from this sampling interval except CI-3-1 exceed the ADEQ proposal 1990 I-HBGL of 2 mg/kg for combined DDT/DDD/DDE. Additionally, the I-HBGL for DDT/DDD/DDE is exceeded in sample CI-1-2, collected from 1.0 to 1.5 feet below land surface. This is also the sample location where the highest

concentrations of DDT/DDD/DDE (1,291 mg/kg) were detected in the 0 to 0.5 foot sample (CI-1-1). The concentration of DDT/DDD/DDE fell below the I-HBGL in the remaining two samples collected from 1.0 to 1.5 feet and in all samples collected from 2.5 to 3.0 feet.

Concentrations of toxaphene were found exceeding the I-HBGL towards the eastern end of the rail spur. Concentrations in samples CI-4, CI-5, CI-6, were 130 mg/kg, 10 mg/kg and 13 mg/kg, respectively. Concentrations of toxaphene did not exceed the laboratory detection limit in the other samples. Dieldrin was detected at a concentration of 7.0 mg/kg in sample CI-4, which exceeded the I-HBGL of 0.02 mg/kg. Additionally, alpha, beta, gamma, and delta BHC were detected in concentrations ranging for a high of 78 mg/kg to a low of 0.22 mg/kg. There is no proposed I-HBGL for these compounds.

3.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

A soil sampling investigation was conducted by Earth Technology for Lewis and Roca and Chemonics Industries in the area of the railroad spur adjacent to the northern property boundary of the Chemonics facility. The facility is located at 734 East Southern Pacific Drive. This soil sampling investigation was conducted as a result of a site assessment and soil sampling investigation conducted by WRA at Capitol Engineering located adjacent to Chemonics at 724 East Southern Pacific Drive.

A total of 13 samples were collected at 7 locations along the railroad spur. The samples were analyzed for organochlorine pesticides and PCBs using EPA Method 8080. Analytical results indicate the presence of DDT/DDE/DDD, Dieldrin and toxaphene in concentrations exceeding the ADEQ proposed 1990 I-HBGLs in samples collected from 0 to 0.5 feet. BHC was also detected in this sample interval, however there are no I-HBGLs for this group of pesticides. The remaining organochlorine pesticides and PCBs included in EPA Method 8080 were below laboratory detection limits in the sampling interval. Analytical results for all samples except CI-1-2 collected at 1 to 1.5 feet and all samples collected at 2 to 2.5 feet indicate that organochlorine pesticides and PCBs were not detected above laboratory detection limits or were detected at concentrations below applicable ADEQ proposed I-HBGLs.

Standard laboratory detection limits exceed ADEQ proposed 1990 I-HBGLs for aldrin, chlordane, dieldrin, toxaphene, and PCBs. ADEQ suggests that in cases where I-HBGLs are below laboratory detection limits, the laboratory detection limit should be used as guidance. Additionally, during this investigation, samples were diluted due to high concentrations of one or more substances and therefore laboratory detection limits were higher than standard limits. Due to this dilution and increase in detection limits, substances may be present at concentrations above the standard laboratory detection limits. However, DDT/DDD/DDE is present along

the length of the rail spur and consistently exceeds the ADEQ proposed 1990 I-HBGL. Due to these results, DDT/DDE/DDD concentration will be used as an indicator pesticide during subsequent actions.

Earth Technology recommends that this preliminary investigation be followed up with a remedial investigation (RI) to determine the vertical and lateral extent of organochlorine pesticides at the site. To make this determination, the RI should include expanded sampling in the vicinity along the rail spur. Samples should be collected from similar depth intervals to those used in the preliminary investigation at sample locations where concentrations of organochlorine pesticides exceeded I-HBGLs. Sample locations adjacent to preliminary investigation sample locations should be selected along the entire rail spur. Based on the results of this investigation, a plan to mitigate organochlorine pesticides at the site can be developed.

4.0 LIMITATIONS

The conclusions and professional opinions presented in this report were developed by The Earth Technology Corporation in accordance with generally accepted engineering, geological, and hydro-geological principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

This report has not been prepared for use by parties other than Lewis and Roca and Chemonics Industries. It may not contain sufficient information for the purposes of other parties or other uses. The data, interpretations, conclusions, and recommendations contained herein should be considered to relate only to the specific project and location discussed herein. The Earth Technology Corporation is not responsible for any conclusions or recommendations that may be made by others, unless we have been given an opportunity to review such conclusions or recommendations and concur in writing.

APPENDIX A

FINAL REPORT OF THE
CAPITOL ENGINEERING PROPERTIES AT
724 EAST SOUTHERN PACIFIC DRIVE
AND 415, 419 SOUTH SEVENTH STREET,
PHOENIX, ARIZONA
SUBMITTED TO ADEQ BY
WATER RESOURCES ASSOCIATES ON JUNE 9, 1990

LETTER OF TRANSMITTAL

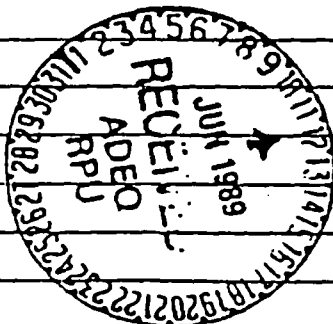
DATE	6-9-89	JOB NO.	3400
ATTENTION	Mr. Lowell M. Carty, Jr.		
RE:	Final Report - Capitol Engineering		

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

COPIES	DATE	NO.	DESCRIPTION
	6-9-89		Final report on the site investigation of the
			Capitol Engineering properties at 724 East
			Southern Pacific Drive and 415, 419 South
			7th street, Phoenix, Arizona

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS



COPY TO

SIGNED:

Kari Kelley for Ed Ricci



Water Resources Associates, Inc.

Hydrologists • Hydrogeologists • Engineers • Forensic Hydrologists

June 9, 1989

Mr. Lowell M. Carty, Jr.
Project Manager, East Washington
WQARF Area
Arizona Department of Environmental Quality
2005 North Central Avenue
Phoenix, Arizona 85004

SUBJECT: FINAL REPORT ON THE SITE INVESTIGATION OF THE CAPITOL ENGINEERING PROPERTIES AT 724 EAST SOUTHERN PACIFIC DRIVE AND 415, 419 SOUTH 7TH STREET, PHOENIX, ARIZONA

Dear Mr. Carty:

Water Resources Associates, Inc. (WRA) is pleased to forward to you the Final Report as referenced above. This report represents the completion of over six months of work at the Capitol Engineering properties. You will recognize that the Final Report contains the analytical results and interpretation of samples collected to complete the site investigation.

In general, our findings have confirmed that Capitol has not contributed to ground-water degradation in the area. Our findings also indicate that previous occupants of the site have not degraded ground water.

Because our study indicates that no hazardous substances have been released into the ground water from this site, it is our understanding that the site does not meet the definition of Responsible Party, as that term is defined by A.R.S., Section 49-283.A. Therefore, because the site does not qualify as a Responsible Party, the site should be delisted from the Final Report for the East Washington WQARF Area.

If you have any questions or comments, please feel free to call.

Respectfully Submitted,

WATER RESOURCES ASSOCIATES, INC.

Edward D. Ricci
Director of Environmental Services

cc: Mr. David Porter - Capitol Engineering
Mr. Kenneth Hodson - Lancy, Scult, and McVey
Mr. Dale Head - Head & McCoy
Mr. Stephen Noel - WRA

MS 03292

**FINAL REPORT
ON THE SITE INVESTIGATION
OF THE
CAPITOL ENGINEERING PROPERTIES
AT
724 EAST SOUTHERN PACIFIC DRIVE
AND
415, 419 SOUTH 7TH STREET,
PHOENIX, ARIZONA**

**Prepared by:
WATER RESOURCES ASSOCIATES, INC.
2702 North 44th Street, Suite 101-B
Phoenix, Arizona 85008**

June 9, 1989

MS 03293



TABLE OF CONTENTS

	<u>Page No.</u>
1.0 INTRODUCTION	1
2.0 SAMPLING AND ANALYSIS PLAN	4
2.1 Sampling Design	4
2.2 Analytical Design	6
3.0 RESULTS	8
3.1 Dry Wells (Sample Location B)	8
3.2 Sumps (Sample Location C) and Drain (Sample Location D)	8
3.3 Rail Spur Area (Sample Location A)	8
4.0 DISCUSSION AND FURTHER ACTION	10
4.1 Solvents	10
4.2 PCBs/Pesticides	11
 FIGURES	 13
TABLES	15
ATTACHMENTS	19



LIST OF FIGURES

<u>Figure No.</u>	<u>Description</u>	<u>Page No.</u>
1	Sample Locations	14



LIST OF TABLES

<u>Table No.</u>	<u>Description</u>	<u>Page No.</u>
1	Detectable Analytical Results of Organic Analyses - Sumps and Drains	16
2	Detectable Analytical Results of Organic Analyses - Rail Spur Area	17
3	Analytical Results of Inorganic Analyses	18



LIST OF ATTACHMENTS

<u>Attachment No.</u>	<u>Description</u>	<u>Page No.</u>
I	Responses to ADEQ Comments	20
II	Chain-of-Custody Records	21
III	Analytical Results	22
IV	Upgradient and Downgradient Water Quality	23
V	Ownership and Property Usage Records	24



1.0 INTRODUCTION

In response to being listed as a "Priority Facility" in the Draft Phase I Report, Eastlake Park Area, October 1988, Capitol Engineering contracted Water Resources Associates, Inc. (WRA) to conduct a comprehensive environmental assessment and site investigation of the subject properties. Capitol was identified in the Draft Phase I report as a priority facility on the basis of their returned questionnaire in which it was documented that limited amounts of solvents were used, although primarily only in spray cans.

A number of documents regarding the subject properties have already been forwarded to the Arizona Department of Environmental Quality (ADEQ) by Water Resources Associates. The title and date of each document is listed below:

1. Work Plan For the Environmental Assessment and Site Investigation of the Capitol Engineering Properties, December 27, 1988.
2. Soil Vapor Surveys of the Capitol Engineering Properties, January 17, 1989.
3. Underground Storage Tank Removal at 724 East Southern Pacific Drive, January 17, 1989.
4. Final Work Plan for the Environmental Assessment and Site Investigation of the Capitol Engineering Properties, April 3, 1989.

The contents of each of these reports are summarized below. The Work Plan (item 1) represented the Draft submitted to ADEQ which detailed the results of WRA's records review and site visits, and provided the recommendations and sampling plans for the further site investigation. It was evidenced during the records review and early site visits that although Capitol Engineering



had not directly contributed to environmental impairment on-site, the activities of previous owners or lessees of the properties may have potentially contributed to environmental degradation. Therefore, a sampling program was prepared by WRA and presented in the Work Plan. The Work Plan also contained information which documented the potential impacts of facilities neighboring the properties at 415 and 419 South 7th Street and 724 East Southern Pacific Drive.

The Soil Vapor Survey (item 2) was conducted in two distinct site locations- on the 724 East Southern Pacific Drive property around Capitol's 250-gallon underground storage tank and north of the shop building at 415 South 7th Street near the Smith Pipe and Steel fence line where unregistered tanks were located.

The Underground Storage Tank Removal (item 3) was implemented by Capitol Engineering. The 250-gallon tank was removed without incident. No leaks had occurred.

The Final Work Plan (item 4) was developed from interaction between the ADEQ and Capitol Engineering as described below:

- o Meeting between ADEQ (Lowell Carty, Wyn Ross, Steve Silver), Water Resources Associates, Inc. (Ed Ricci), Lancy, Scult & McVey (Ken Hodson), and Capitol Engineering (David Porter) on February 17, 1989 at ADEQ.
- o Site visit of Capitol Engineering and surrounding area by ADEQ (Lowell Carty, Wyn Ross) with WRA (Ed Ricci) and Capitol Engineering (David Porter) on February 22, 1989.
- o Review comments on Draft Work Plan by ADEQ (signed Lowell Carty) on March 10, 1989.



- o Telephone communication between ADEQ (Lowell Carty) and WRA (Ed Ricci) on March 27, 1989.

A number of specific ADEQ review comments relating to the conduct of the field sampling program were responded to in the context of the Final Work Plan. Other ADEQ comments which required further information gathering or field study are responded to in the context of this Final Report on the Site Investigation and are presented in Attachment I.

The main emphasis of the Final Work Plan was the presentation of the sampling and analysis plan for further investigation of the subject properties.



2.0 SAMPLING AND ANALYSIS PLAN

2.1 SAMPLING DESIGN

The sampling locations were identified during site visits by WRA on November 10, 1988 and on December 6, 1988. Sample locations are shown on Figure 1. Sampling was targeted in these locations to determine the residual soil quality near the surface and in selected drains and dry wells at the site and to verify that solvents were not discharged to the subsurface. Additionally, other locations were sampled to evaluate whether adjacent properties have impacted the Capitol properties. The coded locations are listed and described more fully below:

Code	Area	Contaminants of Concern	Objective
A	Rail Spur Soils	Pesticides, Hydrocarbons Nutrients	Evaluate potential impacts of Chemonics, Smith Pipe & Steel, Southern Pacific RR, and Economy Foods
B	Dry Well Sludges	Hydrocarbons, Nutrients	Evaluate potential impacts of past and present solvent use and surface runoff
C	Sedimenta- tion Basins (hereafter called sumps)	Hydrocarbons	Evaluate potential impacts of past and present solvent use
D	Drains	Hydrocarbons	Evaluate potential impacts of past and present solvent use

The field sampling program was organized to focus in those areas where the potential for environmental hazards was indicated by the gathering of historical information. Specifically, this area encompasses the drains, dry wells and sumps identified at the 415 and 419 South 7th Street locations, and the rail spur area. Historical information and current practices did not support sampling at the 724 East Southern Pacific Drive location.



The rail spur area was sampled for several purposes. Four samples were collected at nearly equidistant distances along the rail spur area.

Sample A-1 was collected as a surface grab sample (ground surface to 6-inches) to monitor the potential impacts of run-off from the adjacent Chemonics shop buildings and run-off through the rail spur area. A significant volume of overland run-off reportedly flows down the rail spur area from east to west during storm run-off events. Samples A-2 and A-3 were collected further down the rail spur area to the west at a soil depth of 1.0 to 1.5-feet below ground surface. Sample A-4 was collected in the surface soils of the rail spur area behind the Economy Food Service building. This location was selected to detect possible discharges at a pipe extending from the Economy building.

One sludge sample each, B-1 and B-2, was collected in the two dry wells located in the shop building at 419 South 7th Street. The 8-inch drain also located here was not sampled since it elbowed several inches below the ground surface.

Sludge and water samples were collected from the west sump closest to 7th Street (sample C-1) and from the east sump closest to the shop building at 415 South 7th Street (sample C-2). The three sumps on the west side of 415 South 7th Street are interconnected. The middle sump was not sampled.

A soil sample (D-1) was collected from the drain which is connected to the three outside sumps.

All near-surface samples were collected using a stainless steel trowel or hand auger. Samples were placed in 8 oz. glass jars, properly labeled and immediately placed on ice.



Soil (sludge) samples that were collected in the dry wells, sumps, and drains, were obtained using a 10-foot section of PVC pipe. The soil (sludge) samples were placed in 1-quart glass jars, properly labeled, and immediately placed on ice.

All sampling equipment was decontaminated prior to obtaining the first sample and between samples to avoid cross-contamination. Each sampling device was thoroughly washed with a laboratory-grade detergent, followed by a clean water wash and deionized water rinse. Each sample collected was transported, on ice, and delivered to Arizona Testing Laboratories in Phoenix, Arizona. Copies of chain-of-custody records were maintained and are presented as Attachment II.

Samples at locations A-1, A-2, A-3, A-4, B-1, B-2, and C-1 were collected on March 31, 1989. Subsequent to preliminary verbal results forwarded by the laboratory performing the analyses, Arizona Testing Labs, additional samples were collected on April 18, 1989 at locations C-2, D-1, and C-1 (a re-sample of the original C-1 sample).

2.2 ANALYTICAL DESIGN

Presented below is a matrix of the sample locations and constituents selected for analysis:



Constituent/Analyses Method	Location								
	A-1	A-2	A-3	A-4	B-1	B-2	C-1	C-2	D-1
Chlorinated Solvents EPA Method 8010	X	X	X	X	X	X	X	X	X
Aromatic Petroleum Hydrocarbons EPA Method 8020	X	X	X	X					
Total Petroleum Hydrocarbons EPA Method 8015	X	X	X						
Chlorinated Pesticides/ Polychlorinated biphenyls (PCBs) EPA Method 8080	X		X						
Chlorinated Herbicides EPA Method 8150	X								
Organophosphate Pesticides EPA Method 8140	X								
Fertilizers Nitrate(NO ₃), Phosphate(PO ₄), Potassium(K) EPA Methods 9200/6010	X	X	X	X	X	X	X		



(upper 6-inches) at sample location A-1 was 140,000 ppb. This was two orders of magnitude higher than concentrations observed in deeper soils (1-foot to 1.5-feet) at sample location A-3. Trace levels of DDT were reported by the laboratory in sample A-1. The pesticides DDT and DDE were observed in detectable levels in sample A-3.

Samples were analyzed for nutrients in the rail spur sample locations, in the two dry wells, and in one of the sumps (Table 3). The primary objective was to evaluate whether contamination from overland run-off was contributed by sources upgradient from Capitol Engineering. Potassium levels in the A-1 sample were notably higher than those observed at other locations.



4.0 DISCUSSION AND FURTHER ACTION

Two distinct areas of contamination were evidenced during the site investigation - solvents in the drains and sump system and PCBs/pesticides in the rail spur area. These will be discussed separately below.

4.1 SOLVENTS

Although TCA concentrations observed in the drain and sump system were lower than State action levels, their occurrence posed a concern regarding their potential impact on the subsurface and underlying ground water.

On May 17, 1989 the three sumps (collection basins) located adjacent to the street at the 415 South 7th Street location (sample location C) and the 10-inch drain located inside the building at the same address (sample location D) were vacuum pumped by Southwest Vactor Service, Inc.. Each collection basin and the 10-inch drain were thoroughly vacuumed until dry and free of all soil, sludge or debris. Approximately 350-gallons of sludge, soil and wastewater were removed and placed into seven 55-gallon drums located on-site. The drums were placed on wooden pallets and were underlain by plastic sheets. Removal and disposal of the drums in accordance with RCRA guidelines was arranged with Rinchem Resource Recovery.

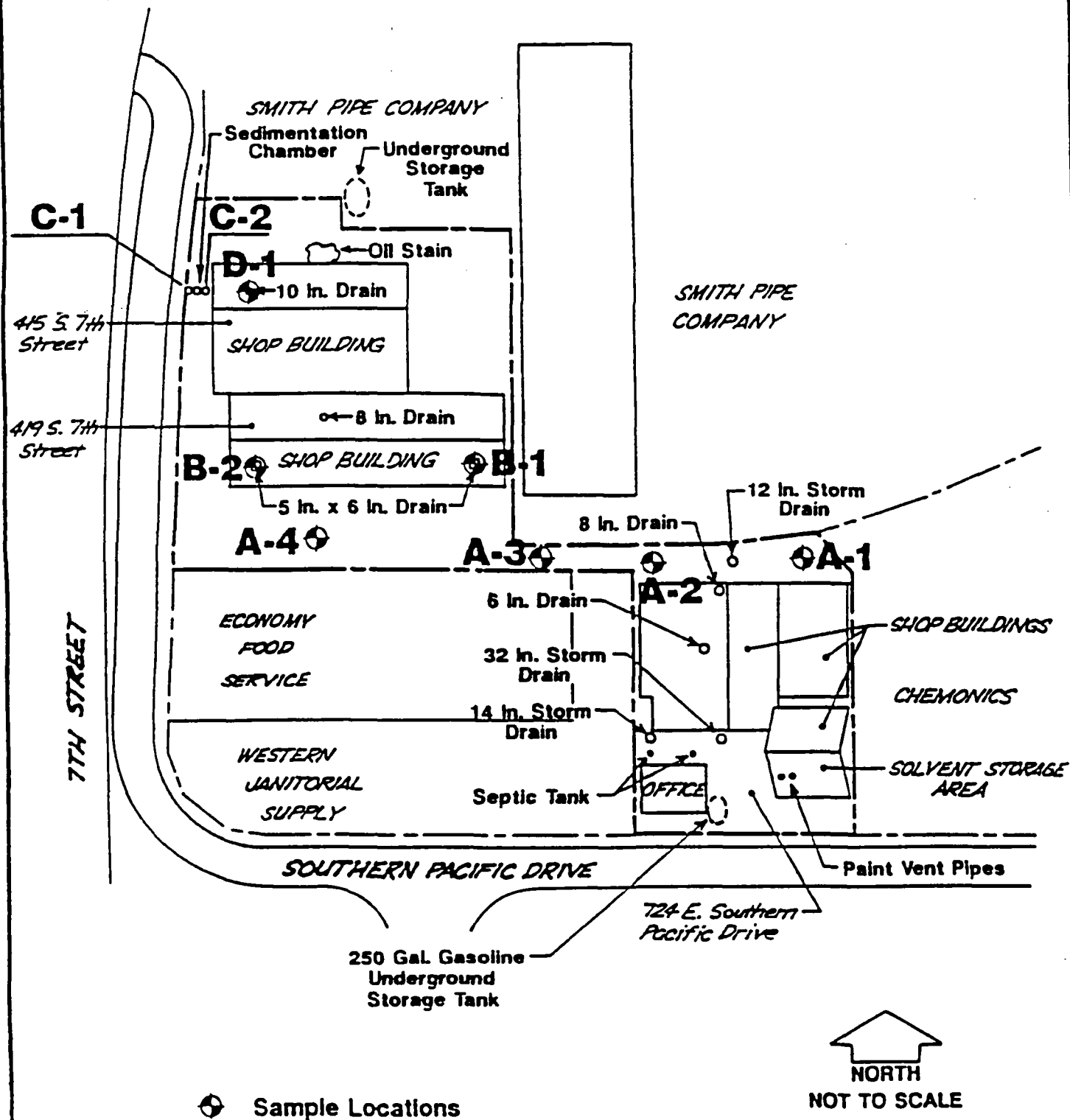
Immediately following the evacuation of the three collection basins and the 10-inch drain, each was inspected to determine the existence of any possible cracks or pathways which could potentially lead to the subsurface.

Each collection basin had a concrete floor completely enclosed by concrete walls, with approximate dimensions of 4 feet by 4 feet by 6 feet. Small openings (6 inches by 6 inches) on both sides of the centrally located collection basin, allow transport of sediments and wastewater between all three basins. Overflow wastewater from the westernmost basin flows



FIGURES





MS 03308

Water Resources Associates, Inc.

SAMPLE LOCATIONS

FIGURE 1

PROJECT NO. 3400
DATE 4/19/89

DRAWN BY KMA
CHECKED BY KDH

TABLES



TABLE 1
DETECTABLE ANALYTICAL RESULTS OF ORGANIC ANALYSES
SUMPS AND DRAIN

			EPA METHOD 8010 ANALYSIS	
			<u>TCA</u>	<u>1,1-DCA</u>
C-1	Outside Sump Adjacent to Street	Sludge/Water (ug/l)A	170 ppb	26 ppb
		Soil/Sludge (ug/kg)	2,400 ppb	530 ppb
C-2	Sump Closest to Building	Sludge (ug/l)B	41.5 ppb	17 ppb
D-1	Drain connection to C-2	Sludge/Water (ug/l)B	31.5 ppb	37.5 ppb
		Soil (ug/kg)	200 ppb	120 ppb
MCL		Water (ug/l)	200 ppb	5 ppb (1,2-DCA)
Action Level		Soil (ug/Kg)	20,000 ppb	38 ppb (1,2-DCA)

MCL - EPA's Maximum Contaminant Level

A Mean of two field samples

B Mean of two laboratory samples



TABLE 2
DETECTABLE ANALYTICAL RESULTS OF ORGANIC ANALYSES
RAIL SPUR AREA

		<u>EPA METHOD 8080 ANALYSES</u>	
A-1	Soil Near Chemonics (Upper 6-inches)	PCBs	- 140,000 ppb;
		DDT	- trace levels
A-3	Soil Down RR Spur (1-foot to 1.5-foot)	PCBs	- 6,200 ppb;
		DDT	- 44 ppb;
		DDE	- 1,200 ppb
EPA Recommended Clean-Up Standard		25,000 ppb	



TABLE 3
ANALYTICAL RESULTS OF INORGANIC ANALYSES

Sample No.	Location	NO ₃	P04	K
B-1	Dry Well	0.8	<0.4	1.5
B-2	Dry Well	1.6	<0.4	1.8
C-1	Sump	0.5	19.	8.1
A-1	Rail Spur	4.1	2.0	190.
A-2	Rail Spur	37.	9.4	57.
A-3	Rail Spur	47.	3.0	54.
A-4	Rail Spur	7.0	0.82	32.



ATTACHMENTS



ATTACHMENT I
RESPONSES TO ADEQ COMMENTS

3
7

ATTACHMENT I

Responses to ADEQ Comments

The following list represents the Arizona Department of Environmental Quality (ADEQ) comments which were not responded to in the Final Work Plan:

Page 2 - Paragraph 4

Specify what solvents were used in the process called "bonderizing".

No historical records or personal interviews showed specifically which solvents were used in the bonderizing process. It is expected that the solvents that were probably used by Phoenix Manufacturing Company during the late 1970's are among the twenty-seven chlorinated solvents detected by EPA Method 8010. The sludges in sumps, dry wells, and drains on the 415 and 419 South 7th Street properties were analyzed for solvents by Method 8010.

Page 6 - Paragraph 1

Determine if the septic tanks were properly closed.

As stated in the Final Work Plan, there are no closure records available for the septic tanks. The City of Phoenix indicates that this is not unusual for facilities which convert their domestic waste systems from septic to City sewerage.

Page 6 - Paragraph 2

Is the septic tank still in use? What was the improvement? What is it used for?

Based on communications with Mr. David Porter of Capitol Engineering, the improvement does not regard the septic system but the construction of an additional drain (14-inch drain) for stormwater runoff collection (see Figure 1). This drain was located near the existing septic systems. The septic system at 724 East Southern Pacific Drive is still in use and serves two toilets, one located in the office and one in the shop building.

Page 7 - Paragraph 2

Demonstrate the connection of the two inside drains to the outside drain.

Mr. David Porter of Capitol Engineering reported that the two inside drains and outside drain are interconnected. He demonstrated this by flushing water through the drains with a garden hose. Mr. Howard Clifford, Vice President of Capitol Engineering, verified the interconnection since he witnessed the installation of the storm runoff drains at the 724 East Southern Pacific Drive property.



ATTACHMENT I - continued
Responses to ADEQ Comments

Page 8 - Paragraph 1

What is the depth of this contamination?

In conjunction with field sampling conducted on March 31, 1989, Water Resources Associates determined the depth of the staining to be 5-inches below the ground surface.

Page 16 - Paragraph 1

Authorization or approval of Remedial Action Plans are necessary under the QWAF Program. If Capitol Engineering Inc. wishes to proceed under the QWAF Program, then the requirements specified in the Arizona Administrative Codes Chapter 7, Article 1, R18-07-107B should be followed.

Capitol Engineering appreciates this guidance by the Department and is taking this advisement under consideration.



ATTACHMENT 2
CHAIN-OF-CUSTODY RECORDS



[illegible]

ARIZONA TESTING LABORATORIES:
817 West Madison Street
Phoenix, Arizona 85007

Client Name: WATER RESOURCES ASSOC.	Address: 2702 N. 44th St.	City: Phnx	State: AZ	Zip Code: 85008	Phone Number: 381-1844	Contact: K. HEBERT
--	------------------------------	---------------	--------------	--------------------	---------------------------	-----------------------

Project Identification: CAPITOL 3400	Project Manager: ED RICCI	Name of Sampler (Please Print): KEVIN HEBERT	Sample Signature: <i>Kevin Hebert</i>	Date: 3/31
---	------------------------------	---	--	---------------

SAMPLE INFORMATION							SAMPLE METHOD		ANALYSIS METHOD				
Sample Description:							Number of Containers					Additional Tests Required	
Soil _____ Waste _____ Other (Describe): _____ Water _____ Oil _____ Wastewater <u>X</u> Groundwater _____													
No.	Sample Identification:	Date:	Time:	Comp	Grab	Sample Location:							
01	B-1	3/31/01	3:15		X	CAPITOL	1		X	X			
02	B-2	↓	3:00		↓	↓	1		X	X			
03	C-1	↓	2:00		↓	↓	2		X	X			
04													
05													
06													
07													
08													
09	MS 03319												
10													

LABORATORY  Arizona Testing Laboratories 817 West Madison Street □ Phoenix, Arizona 85007 □ 602/254-6181	SPECIAL INSTRUCTIONS	
	FOR SAMPLE C-1, RUN THE SAMPLE THAT WILL GET THE BEST RESULTS	

CUSTODY CHAIN							
Relinquished By: <i>Kevin Hebert</i>	Date/Time: 3/31 14:45	Received By: <i>Adm. L...</i>	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:

LABORATORY INFORMATION

Client Name: WATER RESOURCE ASSOC	Address: 2702 N. 44th St.	City: Phnx	State: AZ.	Zip Code: 85008	Phone Number: 381-1844	Contact: K. Hebert
--------------------------------------	------------------------------	---------------	---------------	--------------------	---------------------------	-----------------------

Project Identification: CAPITOL 3400	Project Manager: ED RICCI	Name of Sampler (Please Print): KEVIN HEBERT	Sampler Signature: <i>Kevin Hebert</i>	Date: 3/31
---	------------------------------	---	---	---------------

SAMPLE INFORMATION							SAMPLE METHOD		ANALYSIS METHOD					Additional Tests Required
Sample Description:														
Soil <input checked="" type="checkbox"/> Waste _____ Other (Describe): _____ Water _____ Oil _____ Wastewater _____ Groundwater _____														
No.	Sample Identification:	Date:	Time:	Comp	Grab	Sample Location:	Number of Containers							
01	A-1	3/31/89	12:00		X	CAPITOL	1							
02	A-2	3/31/89	12:30				1							
03	A-3	3/31/89	1:00				1							
04	A-4	3/31/89	1:20				1							
05														
06														
07														
08														
09	MS 03320													
10														

LABORATORY



Arizona Testing Laboratories
 817 West Madison Street □ Phoenix, Arizona 85007 □ 602/254-6181

SPECIAL INSTRUCTIONS

CUSTODY CHAIN							
Relinquished By: <i>Kevin Hebert</i>	Date/Time: 3/31/89 4:45	Received By: <i>A M Lind</i>	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION								
Client Name: WRA		Address: 2702 N. 44th St		City: Phnx	State: AZ	Zip Code: 85008	Phone Number: 351-1811	Contact: KEVIN HERBERT
Project Identification: CAPITOL 3400		Project Manager: ED RICCI		Name of Sampler (Please Print): KEVIN HERBERT			Sampler Signature: <i>Kevin Herbert</i>	Date: 4/18/84

SAMPLE INFORMATION							SAMPLE METHOD		ANALYSIS METHOD												
Sample Description: Soil _____ Waste _____ Other (Describe): <u>WASTEWATER / SLUDGE</u> Water _____ Oil _____ Wastewater _____ Groundwater _____							Number of Containers	PVC PIPE		8610										Additional Tests Required	Laboratory Number
No.	Sample Identification:	Date:	Time:	Comp	Grab	Sample Location:															
01	C-1-2	4/18	3:00	X		415 S. 7th St.	1	X		X								551			
02	C-2	↓	3:30			↓	1	X		X											
03	D-1	↓	2:45	↓		↓	1	X		X											
04																					
05																					
06																					
07																					
08																					
09	MS 03321																				
10																					

LABORATORY <div style="text-align: center;">  <h2 style="margin: 0;">Arizona Testing Laboratories</h2> <p style="margin: 0;">817 West Madison Street □ Phoenix, Arizona 85007 □ 602/254-6181</p> </div>	SPECIAL INSTRUCTIONS <div style="border: 1px solid black; height: 100px; width: 100%;"></div>
---	---

CUSTODY CHAIN							
Relinquished By:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
<i>Ed Ricci</i>	4/18/84	<i>Kevin Herbert</i>	4/18/84				

ATTACHMENT 3
ANALYTICAL RESULTS





Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516007

Sample: Waste

Marked: C-1

Capitol 3400

Received: 03/31/89

Sampled: 03/31/89, 2:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	9.5	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	210.	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

RECEIVE

APR 28 1989

WATER RESOURCE ASSOCIATES INC.

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516007

Sample: Sludge

Marked: C-1

Capitol 3400

Received: 03/31/89

Sampled: 03/31/89, 2:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

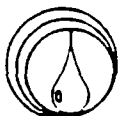
Chloromethane	< 50.	ug/kg
Bromomethane	< 50.	
Vinyl chloride	< 50.	
Chloroethane	< 50.	
Methylene chloride	< 50.	
1,1-Dichloroethene	< 50.	
1,1-Dichloroethane	530.	
trans-1,2-Dichloroethene	< 50.	
Chloroform	< 50.	
1,2-Dichloroethane	< 50.	
1,1,1-Trichloroethane	2400.	
Carbon tetrachloride	< 50.	
Bromodichloromethane	< 50.	
1,2-Dichloropropane	< 50.	
trans-1,3-Dichloropropene	< 50.	
Trichloroethylene	< 50.	
Dibromochloromethane	< 50.	
1,1,2-Trichloroethane	< 50.	
cis-1,3-Dichloropropene	< 50.	
2-Chloroethylvinyl ether	< 50.	
Bromoform	< 50.	
1,1,2,2-Tetrachloroethane	< 50.	
Tetrachloroethylene	< 50.	
Chlorobenzene	< 50.	
1,3-Dichlorobenzene	< 50.	
1,2-Dichlorobenzene	< 50.	
1,4-Dichlorobenzene	< 50.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates Date: April 25, 1989
Attn: Ed Ricci
2702 North 44th Street, Suite 101B Lab.No.: 558301
Phoenix, Arizona 85008

Sample: Wastewater/Sludge

Marked: C-1-2

Received: 04/18/89

Capitol 3400

Sampled: 04/18/89, 3:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	42.	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	130.	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street, Suite 101B
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 558302

Sample: Wastewater/Sludge

Marked: C-2

Capitol 3400

Received: 04/18/89

Sampled: 04/18/89, 3:30 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

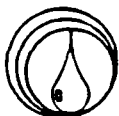
Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	16.	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	30.	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates

Date: April 24, 1989

Attn: Ed Ricci

2702 North 44th Street, Suite 101B

Lab.No.: 558301-03

Phoenix, Arizona 85008

Sample: Wastewater/Sludge

Marked: C-2

Capitol 3400

Received: 04/18/89

Sampled: 04/18/89

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

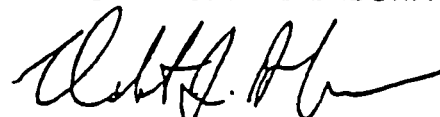
LAB DUPLICATE

Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	18.	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	33.	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates

Date: April 25, 1989

Attn: Ed Ricci

2702 North 44th Street, Suite 101B

Lab. No.: 558301-03

Phoenix, Arizona 85008

Sample: Wastewater/Sludge

Marked: Capitol 3400

Sampled: 04/18/89

Received: 04/18/89

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

LAB SPIKE & RECOVERY

Chloromethane	--
Bromomethane	--
Vinyl chloride	--
Chloroethane	--
Methylene chloride	--
1,1-Dichloroethene	--
1,1-Dichloroethane	--
trans-1,2-Dichloroethene	--
Chloroform	96.
1,2-Dichloroethane	92.
1,1,1-Trichloroethane	91.
Carbon tetrachloride	83.
Bromodichloromethane	94.
1,2-Dichloropropane	--
trans-1,3-Dichloropropene	--
Trichloroethylene	96.
Dibromochloromethane	98.
1,1,2-Trichloroethane	--
cis-1,3-Dichloropropene	--
2-Chloroethylvinyl ether	--
Bromoform	92.
1,1,2,2-Tetrachloroethane	--
Tetrachloroethylene	102.
Chlorobenzene	93.
1,3-Dichlorobenzene	--
1,2-Dichlorobenzene	--
1,4-Dichlorobenzene	--

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates

Date: April 25, 1989

Attn: Ed Ricci

2702 North 44th Street, Suite 101B

Lab.No.: 558303

Phoenix, Arizona 85008

Sample: Wastewater/Sludge

Marked: D-1

Received: 04/18/89

Capitol 3400

Sampled: 04/18/89, 2:45 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

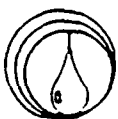
Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	46.	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	44.	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates Date: May 08, 1989
Attn: Ed Ricci
2702 North 44th Street, Suite 101B Lab.No.: 558303
Phoenix, Arizona 85008

Sample: Wastewater/Sludge

Marked: D-1 Total Sample
Capitol 3400

Received: 04/18/89

Sampled: 04/18/89, 2:45 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

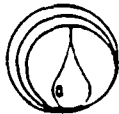
Chloromethane	< 5.0	ug/kg
Bromomethane	< 5.0	
Vinyl chloride	< 5.0	
Chloroethane	< 5.0	
Methylene chloride	< 5.0	
1,1-Dichloroethene	< 5.0	
1,1-Dichloroethane	120.	
trans-1,2-Dichloroethene	< 5.0	
Chloroform	< 5.0	
1,2-Dichloroethane	< 5.0	
1,1,1-Trichloroethane	200.	
Carbon tetrachloride	< 5.0	
Bromodichloromethane	< 5.0	
1,2-Dichloropropane	< 5.0	
trans-1,3-Dichloropropene	< 5.0	
Trichloroethylene	< 5.0	
Dibromochloromethane	< 5.0	
1,1,2-Trichloroethane	< 5.0	
cis-1,3-Dichloropropene	< 5.0	
2-Chloroethylvinyl ether	< 5.0	
Bromoform	< 5.0	
1,1,2,2-Tetrachloroethane	< 5.0	
Tetrachloroethylene	< 5.0	
Chlorobenzene	< 5.0	
1,3-Dichlorobenzene	< 5.0	
1,2-Dichlorobenzene	< 5.0	
1,4-Dichlorobenzene	< 5.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516005

Sample: Waste

Marked: B-1

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 3:15 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	< 1.0	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	< 1.0	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab.No.: 516006

Sample: Waste

Marked: B-2

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 3:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

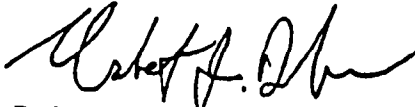
METHOD 8010

Chloromethane	< 1.0	ug/L
Bromomethane	< 1.0	
Vinyl chloride	< 1.0	
Chloroethane	< 1.0	
Methylene chloride	< 1.0	
1,1-Dichloroethene	< 1.0	
1,1-Dichloroethane	< 1.0	
trans-1,2-Dichloroethene	< 1.0	
Chloroform	< 1.0	
1,2-Dichloroethane	< 1.0	
1,1,1-Trichloroethane	< 1.0	
Carbon tetrachloride	< 1.0	
Bromodichloromethane	< 1.0	
1,2-Dichloropropane	< 1.0	
trans-1,3-Dichloropropene	< 1.0	
Trichloroethylene	< 1.0	
Dibromochloromethane	< 1.0	
1,1,2-Trichloroethane	< 1.0	
cis-1,3-Dichloropropene	< 1.0	
2-Chloroethylvinyl ether	< 1.0	
Bromoform	< 1.0	
1,1,2,2-Tetrachloroethane	< 1.0	
Tetrachloroethylene	< 1.0	
Chlorobenzene	< 1.0	
1,3-Dichlorobenzene	< 1.0	
1,2-Dichlorobenzene	< 1.0	
1,4-Dichlorobenzene	< 1.0	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516001

Sample: Soil

Marked: A-1

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 12:00 p. m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

Chloromethane	< 10.	ug/kg
Bromomethane	< 10.	
Vinyl chloride	< 10.	
Chloroethane	< 10.	
Methylene chloride	< 10.	
1,1-Dichloroethene	< 10.	
1,1-Dichloroethane	< 10.	
trans-1,2-Dichloroethene	< 10.	
Chloroform	< 10.	
1,2-Dichloroethane	< 10.	
1,1,1-Trichloroethane	< 10.	
Carbon tetrachloride	< 10.	
Bromodichloromethane	< 10.	
1,2-Dichloropropane	< 10.	
trans-1,3-Dichloropropene	< 10.	
Trichloroethylene	< 10.	
Dibromochloromethane	< 10.	
1,1,2-Trichloroethane	< 10.	
cis-1,3-Dichloropropene	< 10.	
2-Chloroethylvinyl ether	< 10.	
Bromoform	< 10.	
1,1,2,2-Tetrachloroethane	< 10.	
Tetrachloroethylene	< 10.	
Chlorobenzene	< 10.	
1,3-Dichlorobenzene	< 10.	
1,2-Dichlorobenzene	< 10.	
1,4-Dichlorobenzene	< 10.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516001

Sample: Soil

Marked: A-1

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 12:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8080*

Alpha BHC	< 100.	mg/kg**
Lindane	< 100.	
Beta BHC	< 100.	
Heptachlor	< 100.	
Delta BHC	< 100.	
Aldrin	< 100.	
Heptachlor Epoxide	< 100.	
Endosulfan I	< 100.	
PP'-DDE	< 100.	
Dieldrin	< 100.	
Endrin	< 100.	
PP'-DDD	< 100.	
Endosulfan II	< 100.	
PP'-DDT	< 100.	
Endrin Aldehyde	< 100.	
Endosulfan Sulfate	< 100.	
Methoxychlor	< 100.	
Chlordane	< 100.	
Toxaphene	< 100.	
PCB(s)	140.	

< = less than the detection
limit given

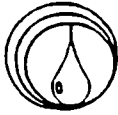
*Arochlor 1254

**Higher detection limits
due to matrix interference;
PCB contamination

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates, Inc.
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab.No.: 516001

Sample: Soil

Marked: A-1

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 12:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

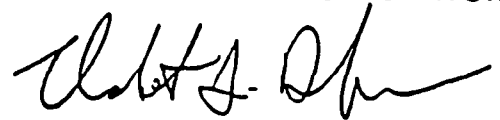
METHOD 8150

		<u>LAB DUPLICATE</u>	<u>LAB SPIKE & RECOVERY</u>
2,4-D	< 20. ug/kg	< 20. ug/kg	99.
2,4-DB	< 20.	< 20.	--
2,4,5-T	< 10.	< 10.	--
Silvex	< 2.0	< 2.0	101.
Dalapon	< 100.	< 100.	--
Dicamba	< 10.	< 10.	--
Dichloroprop	< 20.	< 20.	--
Dinoseb	< 2.0	< 2.0	--
MCPA	< 4000.	< 4000.	--
MCPP	< 4000.	< 4000.	--

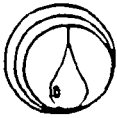
< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake

MS 03335



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates, Inc.
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516001

Sample: Soil

Marked: A-1

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 12:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8140

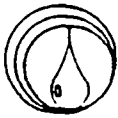
			<u>LAB DUPLICATE</u>	<u>LAB SPIKE & RECOVERY</u>
Diazinon	<	2.0 ug/kg	< 2.0 ug/kg	--
Disulfoton	<	5.0	< 5.0	--
Demeton	<	10.	< 10.	--
Parathion Methyl	<	2.0	< 2.0	83.
Malathion	<	5.0	< 5.0	96.
Parathion Ethyl	<	2.0	< 2.0	87.
Ethion	<	100.	< 100.	--
Azinphos Methyl	<	1000.	< 1000.	--

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516002

Sample: Soil

Marked: A-2

Capitol 3400

Received: 03/31/89

Sampled: 03/31/89, 12:30 p. m

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

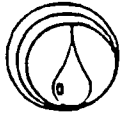
Chloromethane	< 10.	ug/kg
Bromomethane	< 10.	
Vinyl chloride	< 10.	
Chloroethane	< 10.	
Methylene chloride	< 10.	
1,1-Dichloroethene	< 10.	
1,1-Dichloroethane	< 10.	
trans-1,2-Dichloroethene	< 10.	
Chloroform	< 10.	
1,2-Dichloroethane	< 10.	
1,1,1-Trichloroethane	< 10.	
Carbon tetrachloride	< 10.	
Bromodichloromethane	< 10.	
1,2-Dichloropropane	< 10.	
trans-1,3-Dichloropropene	< 10.	
Trichloroethylene	< 10.	
Dibromochloromethane	< 10.	
1,1,2-Trichloroethane	< 10.	
cis-1,3-Dichloropropene	< 10.	
2-Chloroethylvinyl ether	< 10.	
Bromoform	< 10.	
1,1,2,2-Tetrachloroethane	< 10.	
Tetrachloroethylene	< 10.	
Chlorobenzene	< 10.	
1,3-Dichlorobenzene	< 10.	
1,2-Dichlorobenzene	< 10.	
1,4-Dichlorobenzene	< 10.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516003

Sample: Soil

Marked: A-3

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 1:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS


METHOD 8010

Chloromethane	< 10.	ug/kg
Bromomethane	< 10.	
Vinyl chloride	< 10.	
Chloroethane	< 10.	
Methylene chloride	< 10.	
1,1-Dichloroethene	< 10.	
1,1-Dichloroethane	< 10.	
trans-1,2-Dichloroethene	< 10.	
Chloroform	< 10.	
1,2-Dichloroethane	< 10.	
1,1,1-Trichloroethane	< 10.	
Carbon tetrachloride	< 10.	
Bromodichloromethane	< 10.	
1,2-Dichloropropane	< 10.	
trans-1,3-Dichloropropene	< 10.	
Trichloroethylene	< 10.	
Dibromochloromethane	< 10.	
1,1,2-Trichloroethane	< 10.	
cis-1,3-Dichloropropene	< 10.	
2-Chloroethylvinyl ether	< 10.	
Bromoform	< 10.	
1,1,2,2-Tetrachloroethane	< 10.	
Tetrachloroethylene	< 10.	
Chlorobenzene	< 10.	
1,3-Dichlorobenzene	< 10.	
1,2-Dichlorobenzene	< 10.	
1,4-Dichlorobenzene	< 10.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab.No.: 516003

Sample: Soil

Marked: A-3

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 1:00 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8080*

Alpha BHC	< 10.	ug/kg
Lindane	< 10.	
Beta BHC	< 10.	
Heptachlor	< 10.	
Delta BHC	< 50.	
Aldrin	< 10.	
Heptachlor Epoxide	< 50.	
Endosulfan I	< 50.	
PP'-DDE	1200.	
Dieldrin	< 10.	
Endrin	< 50.	
PP'-DDD	< 50.	
Endosulfan II	< 20.	
PP'-DDT	44.	
Endrin Aldehyde	< 100.	
Endosulfan Sulfate	< 200.	
Methoxychlor	< 100.	
Chlordane	< 50.	
Toxaphene	< 200.	
PCB(s)	6200.	

< = less than the detection
limit given

*Arochlor 1254

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516004

Sample: Soil

Marked: A-4

Received: 03/31/89

Capitol 3400

Sampled: 03/31/89, 1:20 p.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8010

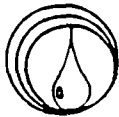
Chloromethane	< 10.	ug/kg
Bromomethane	< 10.	
Vinyl chloride	< 10.	
Chloroethane	< 10.	
Methylene chloride	< 10.	
1,1-Dichloroethene	< 10.	
1,1-Dichloroethane	< 10.	
trans-1,2-Dichloroethene	< 10.	
Chloroform	< 10.	
1,2-Dichloroethane	< 10.	
1,1,1-Trichloroethane	< 10.	
Carbon tetrachloride	< 10.	
Bromodichloromethane	< 10.	
1,2-Dichloropropane	< 10.	
trans-1,3-Dichloropropene	< 10.	
Trichloroethylene	< 10.	
Dibromochloromethane	< 10.	
1,1,2-Trichloroethane	< 10.	
cis-1,3-Dichloropropene	< 10.	
2-Chloroethylvinyl ether	< 10.	
Bromoform	< 10.	
1,1,2,2-Tetrachloroethane	< 10.	
Tetrachloroethylene	< 10.	
Chlorobenzene	< 10.	
1,3-Dichlorobenzene	< 10.	
1,2-Dichlorobenzene	< 10.	
1,4-Dichlorobenzene	< 10.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates, Inc. Date: April 25, 1989
Attn: Ed Ricci
2702 North 44th Street, Suite 101B Lab.No.: 516001-03
Phoenix, Arizona 85008

Sample: Soil

Marked: Capitol 3400
Sampled: 03/31/89

Received: 03/31/89

Submitted by: Same

REPORT OF LABORATORY TESTS

MODIFIED METHOD 8015

SAMPLES MARKED

TOTAL PETROLEUM HYDROCARBONS

A-1	< 20.	mg/kg
A-2	< 20.	
A-3	< 20.	

QUALITY ASSURANCE/QUALITY CONTROL DATA

Lab Duplicate, % Range \pm	2.
Lab Spike, % Recovery	104.
Extraction: 04/03/89	
Analysis: 04/03/89	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates, Inc. Date: April 25, 1989
Attn: Ed Ricci
2702 North 44th Street, Suite 101B Lab.No.: 516001-04
Phoenix, Arizona 85008

Sample: Soil

Marked: Capital 3400
Sampled: 03/31/89
See Below

Received: 03/31/89

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD 8020

<u>SAMPLES MARKED</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYLBENZENE</u>	<u>XYLENE (S)</u>
A-1	< 10.	< 10.	< 10.	< 10. ug/
A-2	< 10.	< 10.	< 10.	< 10.
A-3	< 10.	< 10.	< 10.	< 10.
A-4	< 10.	< 10.	< 10.	< 10.

QUALITY ASSURANCE/QUALITY CONTROL DATA

Lab Duplicate,	0.*	0.*	0.*	0.*
% Range ±				
Lab Spike,	89.	83.	--	81.
% Recovery				

Extraction: 04/07/89

Analysis: 04/07/89

< = less than the detection
limit given

*Duplicates below detection

Respectfully submitted,

ARIZONA TESTING LABORATORIES


Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516005-07

Sample: Waste

Marked: Capitol 3400
Sampled: 03/31/89
See Below

Received: 03/31/89

Submitted by: Same

REPORT OF LABORATORY TESTS

<u>SAMPLES MARKED</u>	<u>NITRATE-N*</u>	<u>PHOSPHATE-P*</u>	<u>POTASSIUM*</u>
B-1	0.8	< 0.4	1.5 mg/L
B-2	1.6	< 0.4	1.8
C-1	0.5	19.	8.1

< = less than the detection
limit given

*Note: parameters analyzed on
liquid fraction of sample

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

817 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Water Resources Associates
Attn: Ed Ricci
2702 North 44th Street
Phoenix, Arizona 85008

Date: April 25, 1989

Lab. No.: 516001-04

Sample: Soil

Marked: Capitol 3400
Sampled: 03/31/89
See Below

Received: 03/31/89

Submitted by: Same

REPORT OF LABORATORY TESTS

<u>SAMPLES MARKED</u>	<u>NITRATE-N*</u>	<u>PHOSPHATE-P*</u>	<u>POTASSIUM*</u>	
A-1	4.1	2.0	190.	mg/kg
A-2	37.	9.4	57.	
A-3	47.	3.0	54.	
A-4	7.0	0.82	32.	

*Note: 1-to-5 water extract calculated
to original sample

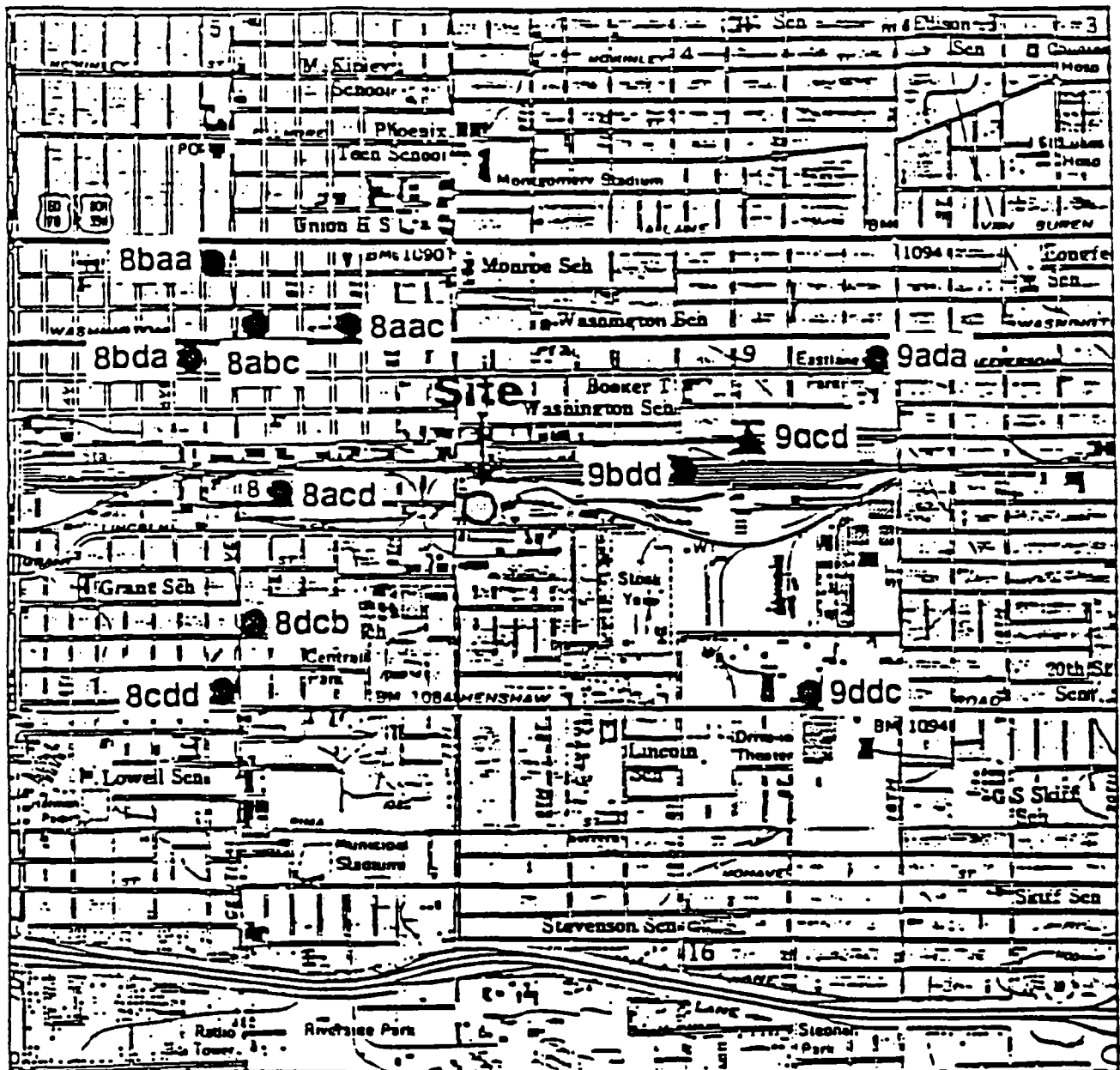
Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake

ATTACHMENT 4
UPGRADIENT AND DOWNGRADIENT WATER QUALITY





BASE MAP : USGS 7.5 Minute Quadrangle - Phoenix, Az.

LEGEND

- Well Location, Water Quality Data Reported
- ▲ Well Location, Water Quality Data Not Available



MS 03346

Water Resources Associates, Inc.

PROJECT NO 3400
DATE 2/15/89
DRAWN BY KMA
CHECKED BY KDH

**WELLS WITH AVAILABLE
WATER QUALITY DATA
IN VICINITY OF
CAPITOL ENGINEERING PROPERTY**

**SUMMARY OF REPORTED VOLATILE ORGANIC COMPOUNDS (IN PPB) IN
WELLS UPGRADEMENT AND DOWNGRADEMENT FROM CAPITOL ENGINEERING**

Parameters	Federal MCL (ppb)	State Action Level (ppb)	UPGRADIENT WELLS				DOWNGRADIENT WELLS										
			9ada 9/23/84 E	9ada 7/29/87 ADE0	9adc 8/3/88 E	9add 9/27/84 E	8aac 3/18/86 E	8acd 9/26/86 E	8acb 9/28/84 E	8acc 9/23/84 ADE0	8dad1 8/1/88 E	8dad2 9/27/84 ADE0	8dad3 8/1/88 E	8dad4 8/1/88 E	8dad5 8/1/88 E	8dad6 9/27/84 ADE0	8dad7 9/23/84 ADE0
1,1,1-TCA	200	200	-	4.4	-	-	-	-	-	0.5 (tr)	<0.2	-	0.3	0.5	<0.2	-	0.5 (tr)
1,1-DCA	-	-	-	4.3	0.4	-	-	-	-	0.5 (tr)	2.0	-	3.1	0.6	0.4	-	1.5 (tr)
1,1-DCE	7.0	7.0	11, 10	3.4	3.4	-	-	-	-	0.5 (tr)	7.3	-	15	2.3	3.4	-	5.3
Chloroform	100	3.0	5, 5	4.5	-	5.0	-	0.0	5.0	0.5 (tr)	-	-	-	-	-	5.0	0.3
Methylene Chloride	-	4.7	40, 10	6.3	-	43	-	-	10	0.5 (tr)	-	-	-	-	-	20	0.5 (tr)
TCE	5.0	5.0	44, 41	61.1	4.9	5.0	16	14	2.4	3.0	37.5	12.0	50	5.7	4.9	202	300
1,1,2-DCE	5.0	70	-	4.3	0.0	-	-	-	-	0.5 (tr)	16.5	-	22.0	1.0	0.0	23	43
Freon 11	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.4
PCE	-	1.0	-	5.2	0.3	5.0	-	-	5.0	0.5 (tr)	1.4	-	2.0	1.4	0.3	5.0	2.5
Benzene	5.0	5.0	-	-	-	-	-	-	-	-	-	5.0	-	-	-	-	-
1,2-DCA	5.0	5.0	5, -	-	-	-	-	-	-	0.5 (tr)	0.4	-	0.5	0.6	<0.2	5.0	2.7
Bromodichloromethane	100	-	-	-	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	<0.2	-	0.5 (tr)
Carbon Tetrachloride	5.0	5.0	-	-	-	-	-	-	-	0.5 (tr)	-	-	-	-	-	-	0.5 (tr)
Chlorobenzene	-	60	-	-	-	-	-	-	-	0.5 (tr)	-	-	-	-	-	-	0.5 (tr)
1,4-Dichlorobenzene	75	-	-	-	-	-	-	-	-	0.5 (tr)	-	-	-	-	-	-	-
Chloromethane	-	0.5	-	-	-	-	-	-	-	0.5 (tr)	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	<0.2	-	<0.2	0.3	<0.2	-	-

NOTES:

- ppb = parts per billion
- (tr) = trace levels reported
- = dashed lines indicate that data results were not reported and are presumed to be below detectable levels
- E = information extracted from Kleinfelder, October, 1980, Draft Phase I Report, Eastlake Park Area
- ADE0 = information extracted from Arizona Department of Environmental Quality files on water quality

February 14, 1989
Water Resources Associates, Inc.

ATTACHMENT 5
OWNERSHIP AND PROPERTY USAGE RECORDS



OWNERSHIP AND USAGE OF PROPERTY AT

724 East Southern Pacific Drive

Owner	Year	Lessee	Year	Uses
Southern Pacific Railroad Company	Before late 40's	-	-	Rail Yard
Capitol Engineering	Late 40's or early 50's to present	-	-	Metal fabrication and painting

OWNERSHIP AND USAGE OF PROPERTY AT

415 South 7th Street

Owner	Year	Lessee	Year	Uses
Southern Pacific Railroad Company	Unknown	-	-	Rail Yard
Comstock Steel Company	Before the 50's	-	-	Pipes, Steel Yard
Rio Grande Steel	Early 50's to 1981	Arizona Welding Equipment Company	50's to July '60	Welding Gases and Supplies
		Skyline Manufacturing	1968-69	Painting
		Painting Company	unknown	Painting
		Phoenix Manufacturing	1976-1981	Evaporative Cool Manufacturer
Capitol Engineering Company	1981 to present	-	-	Metal Fabrication and Painting

OWNERSHIP AND USAGE OF PROPERTY AT

419 South 7th Street

Owner	Year	Lessee	Year	Uses
Southern Pacific Railroad Company	Before 1983	-	-	Rail Yard
		Utility Supply Light Fixture	Early 60's to 1976	Manufacture of street light pol nuts, bolts, har ware
		Phoenix Manufacturing	1976-1983	Evaporative cool Plant
Capitol Engineering Company	1983 to	-	-	Metal Fabricatio and Painting

100

100

100

100

100

100

B

APPENDIX B -

SOIL SAMPLING PLAN
734 EAST SOUTHERN PACIFIC DRIVE
PHOENIX, ARIZONA

RAIL SPUR INVESTIGATION
SOIL SAMPLING PLAN
734 E. SOUTHERN PACIFIC DRIVE
PHOENIX, ARIZONA

Prepared for:

LEWIS AND ROCA
40 N. Central Avenue
Phoenix, Arizona 85004

Prepared by:

THE EARTH TECHNOLOGY CORPORATION
2411 West 14th Street
Suite 210
Tempe, Arizona 85281

June 1990

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 BACKGROUND	2-1
3.0 OBJECTIVE OF THE SAMPLING EFFORT	3-1
4.0 SAMPLING RATIONALE	4-1
4.1 SAMPLING LOCATIONS	4-1
5.0 MAPS	5-1
6.0 REQUEST FOR ANALYSIS	6-1
7.0 SAMPLING METHODS AND PROCEDURES	7-1
7.1 SAMPLE COLLECTION TECHNIQUES	7-1
7.2 DISPOSAL OF CONTAMINATED MATERIALS	7-1
7.3 EQUIPMENT DECONTAMINATION	7-1
7.4 SAMPLE CONTAINERS AND PRESERVATION	7-3
7.5 SAMPLE PACKAGING AND SHIPMENT	7-3
7.6 SAMPLE DOCUMENTATION	7-3
8.0 SITE SAFETY PLAN	8-1
8.1 HEALTH AND SAFETY RESPONSIBILITIES	8-1
8.2 HAZARD ASSESSMENT	8-2
8.2.1 Potential Chemical Exposure	8-2
8.2.2 Heat Stress	8-2
8.2.3 General Safety Practices	8-3
8.3 PERSONAL PROTECTION EQUIPMENT	8-4
8.4 DESIGNATION OF WORK AREAS AT THE SITE	8-5
8.5 PERSONNEL DECONTAMINATION PROCEDURES	8-7
8.6 EMERGENCY RESOURCES	8-8

TABLE OF CONTENTS

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
5-1.	General Site Location Map	5-2
8-1.	Contamination Reduction System	8-6
8-2.	Site Location and Route to Nearest Hospital	8-9

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
7-1.	Summary of Equipment Cleaning Procedures	7-2

1.0 INTRODUCTION

This sampling plan contains information concerning the site and a description of the tasks to be performed during the Sampling Investigation at 734 E. Southern Pacific Drive for Lewis and Roca. Earth Technology has developed this sampling plan in accordance with the procedures in the U.S. Environmental Protection Agency's (EPA, 1986) "Test Methods for Evaluating Solid Waste" and the Arizona Department of Environmental Quality's (ADEQ, 1988) "Quality Assurance Project Plan".

2.0 BACKGROUND

The Chemonics Industries, Inc. (Chemonics) Phoenix facility is located at 734 E. Southern Pacific Drive, Phoenix, Arizona 85034. The site consists of 4.457 fenced acres and is bounded by Southern Pacific Drive on the south and the Southern Pacific Railroad tracks on the north. Capitol Engineering is located to the west, at 724 East Southern Pacific Drive. The area to the east appears to be used for truck parking and railroad car unloading and switching.

On site are buildings consisting of warehousing, fabrication, office, and laboratory having a combined space of approximately 194,147 square feet. The facility is currently occupied by Chemonics Industries and five (5) sublessees.

Chemonics facility lies within the East Washington Water Quality Assurance Revolving Fund (WQARF) study area. Six areas in the East Washington area were identified in which concentrations of volatile organic compounds (VOC's) exceeded maximum contaminant levels (MCL's) or Arizona Action Levels (AAL's).

Water Resource Associates, Inc. (WRA) conducted an environmental assessment and site investigation of the Capitol Engineering properties located immediately west of Chemonics in response to the Draft Phase I Report, Eastlake Park Area, October 1988. Sampling conducted by WRA during their investigation indicated the presence of organochlorine pesticides along the railroad spur north of the property. The railroad spur originates from a switching yard located east of Chemonics.

3.0 OBJECTIVE OF SAMPLING EFFORT

The primary objective of this sampling investigation is to assess the presence of chlorinated pesticides on the railroad spur adjacent to the northern perimeter of the subject property. To accomplish these objectives, Earth Technology has prepared this sampling program. The following sections provide the sampling rationale, locations, analyses, methodology and procedures.

4.0 SAMPLING RATIONALE

The sampling rationale is based on the objectives of the sampling program, specifically evaluation of the presence of chlorinated pesticides on the railroad spur along the northern perimeter.

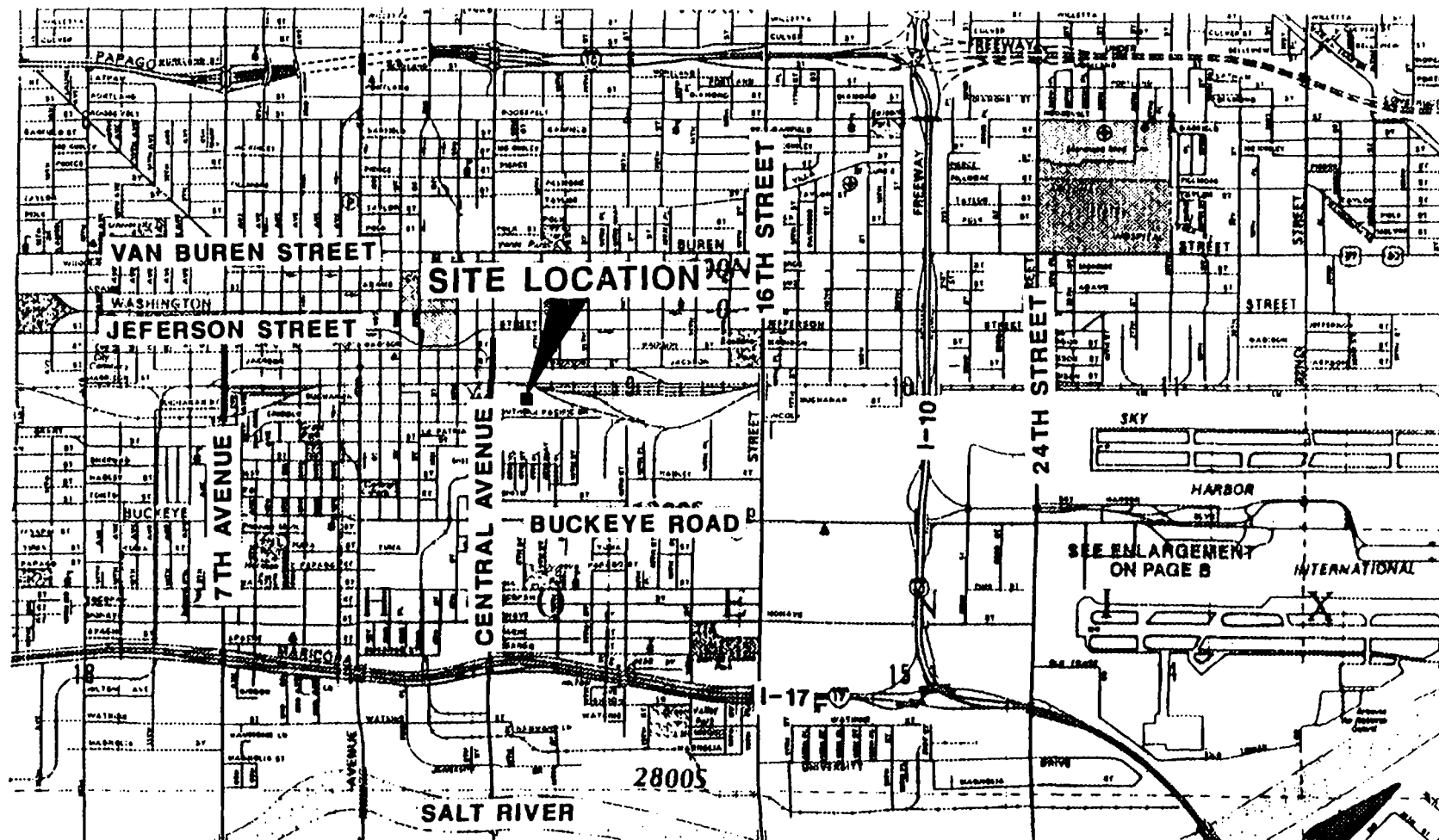
4.1 SAMPLING LOCATIONS

Soil sample locations were selected based on previous sampling conducted at adjacent facilities. Seven locations along the northern property boundary will be sampled. Samples will be collected at depth intervals from 0 to 0.5 feet, 1 foot to 1.5 feet and 2 feet to 2.5 feet at the western 3 locations. The depths of 0 to 0.5 feet, 1 foot to 1.5 feet and 2 feet to 2.5 feet are consistent with previous sampling in the area. Additionally, 4 samples will be collected from 0 to 0.5 feet along the eastern portion of the railroad spur to evaluate the presence of pesticides in this area. This will result in 13 samples along the northern boundary of the property. This is an area receiving a significant volume of runoff from east to west during storm runoff events.

5.0 MAPS

The following location maps provide site location in the Phoenix area.

MS 03362



Source: Wide World of Maps, 1990
Reproduced by permission #900222-A

0 1
SCALE IN MILES



The Earth Technology Corporation

Project No: 90-621
Chemonics

SITE LOCATION
734 EAST SOUTH PACIFIC DRIVE
PHOENIX, ARIZONA

Figure 5-1

10-90

6.0 REQUEST FOR ANALYSIS

Soil samples collected at the Phoenix facility will be analyzed for organochlorine pesticides/PCB's using Environmental Protection Agency (EPA) method 8080. The methods of analysis were selected based on the following contaminants detected previously at an adjacent facility and on historical on-site chemical usage:

- o PCB's, chlorinated pesticides (Method 8080).

7.0 SAMPLING METHODS AND PROCEDURES

7.1 SAMPLE COLLECTION TECHNIQUES

Soil sampling will be performed using a 3-inch diameter stainless-steel hand auger. Soil samples will be collected using the following procedure:

1. Advance the pre-cleaned hand auger into the soil by twisting the "T" handle. Based upon the length of the core barrel, the auger will be advanced in 6-inch intervals.
2. When the core barrel is full, withdraw the auger and extrude the soil into an appropriate sample container.
3. Check that a Teflon™ liner is present in the lid of the sample container, if required. Secure the lid tightly. Label the sample container with the appropriate sample tag. Be sure to label the tag carefully and clearly, addressing all the categories or parameters. Place chain-of-custody seal on sample container.
4. Place the sample container in a self-sealing plastic bag and store it in a portable cooler containing blue ice for transport to the laboratory. Complete all chain-of-custody documents and record information in the field log book.
5. Decontaminate equipment between sample locations and sampling intervals to minimize the potential for cross-contamination.

7.2 DISPOSAL OF CONTAMINATED MATERIALS

Cuttings generated during hand augering will remain on-site and will be used to back fill the boreholes.

7.3 EQUIPMENT DECONTAMINATION

Appropriate tools and materials used during hand augering and sampling will be thoroughly cleaned before and after use at each sampling station to minimize the potential for cross-contamination and to maintain the integrity of samples. The materials and equipment cleaning procedures to be used are summarized in Table 7-1.

TABLE 7-1. SUMMARY OF EQUIPMENT CLEANING PROCEDURES

Equipment/Material Description	Cleaning Procedure	Drying Procedure
Hand auger	A	C
Sample containers	B	B
Portable ice coolers	D	C

Cleaning and Drying Procedures:

- A - Alconox™ detergent wash, fresh water rinse twice, final rinse with deionized water.
- B - Cleaned and prepared in accordance with the following I-Chem sample container cleaning procedures: thoroughly wash containers with detergent and hot water; triple rinse with tap water; triple rinse with D.I. water; rinse with 0.5% nitric acid and drain; rinse with D.I. water and drain thoroughly. Sample containers will be prepared by analytical laboratory prior to receipt by Earth Technology.
- C - Air dried on racks or plastic tarps
- D - Wiped clean with detergent solution.

7.4 SAMPLE CONTAINERS AND PRESERVATION

Following sample collection, the sample containers will be immediately placed in a cooler containing blue ice until they are delivered to the laboratory.

7.5 SAMPLE PACKAGING AND SHIPMENT

Soil sample jars will be sealed individually in self-sealing plastic bags, stored in a portable cooler containing blue ice, and transported to the laboratory for analysis. Samples will be transported to the laboratory within 24 hours of collection following standard chain-of-custody procedures. Samples to be stored overnight will be placed in a secure, indoor area and the cooler will be sealed to detect tampering.

Shipping containers will meet applicable state and federal Department of Transportation requirements for safe transport. Additionally, the containers will be sealed in a manner such that obvious tampering can be detected immediately upon receipt by the testing laboratory. The field chain-of-custody form will be affixed to the outside of the shipping container in a sealed clear plastic envelope. Using this technique, tampering with the form can easily be noted.

7.6 SAMPLE DOCUMENTATION

Sample documentation components include sample labels, sample seals, field log book, and chain-of-custody forms. Samples will be labeled at the time of collection with the following information:

- | | |
|--------------------|----------------------------------|
| o Project number | o Preservative (if applicable) |
| o Sample location | o Date and time of sampling |
| o Sample ID number | o Initials of collector |
| o Depth | o Supplier container lot number. |
| o Matrix | |

In order to discourage unauthorized tampering, sample seals will be placed over the container lid and will include the following information:

- o Project number
- o Sample location
- o Sample ID number
- o Date and time
- o Initials of collector.

All information pertinent to the sampling program will be recorded in a field log. This includes, but is not limited to, the following items:

- o Project name and number
- o Location of site
- o Site contact(s)
- o Purpose of sampling
- o Date and time of collection
- o Sampling locations, sample ID numbers, and methodology
- o Number and volume of samples taken
- o Field observations (e.g., sample descriptions)
- o Sample distribution
- o Maps, photographs, and/or drawings
- o Field measurements
- o Sampling personnel.

After each sample is collected, the chain-of-custody record will be completed. The chain-of-custody record will always accompany the samples. The chain-of-custody for possession and responsibility of samples will be documented from the time and place of sample acquisition to the time and place of their final destination. Field personnel initially collecting the sample will be responsible for the care and custody of the sample until it is properly transferred to delivery or laboratory personnel.

The chain-of-custody form provides the sample identification number, date, time, matrix, number of containers, sampler's signature, project number, project name, and analysis required. Each person or organization who relinquishes and/or receives responsibility for the samples shall sign, date, and retain one copy of the record for the project files. The original record shall stay with the samples until they are relinquished to the laboratory receiving agent.

8.0 SITE SAFETY PLAN

Earth Technology has prepared the following Site Safety Plan (SSP) for Earth Technology personnel for activities at the Chemonics site in Phoenix, Arizona. The purpose of the SSP is to:

- o Establish personnel safety/protection standards that meet or exceed regulatory requirements for hazardous waste site workers
- o Define responsibilities of different organizations and personnel
- o Establish safe operating procedures relative to physical and chemical conditions encountered on the site
- o Delineate contaminated work areas
- o Provide for contingencies which may arise during the course of sampling activities.

This plan outlines the health and safety procedures and equipment required for sampling activities at the site in order to minimize the potential for chemical exposure of field personnel. The procedures and equipment requirements presented herein were developed based on a review of available data and an evaluation of the potential hazards associated with exposure to contaminants during sampling activities.

8.1 HEALTH AND SAFETY RESPONSIBILITIES

A Site Health and Safety Officer (SHSO) will be designated for the sampling investigation. The responsibilities of the SHSO will be as follows:

- o Ensure that all personnel allowed to enter the site are aware of the potential hazards associated with substances known or suspected to be present at the site
- o Ensure that said personnel are aware of the provisions of the SSP and are instructed in the safety practices defined in the plan, including emergency procedures
- o Ensure that the appropriate safety equipment is available and properly utilized by all personnel on the site.

Additionally, the SHSO may alter the SSP to fit onsite conditions.

8.2 HAZARD ASSESSMENT

8.2.1 Potential Chemical Exposure

Previous site assessments conducted by WRA at adjacent facilities indicated elevated levels of chlorinated pesticides, and PCB's. Based on reported analyses, the concentrations of these compounds in soils are at a level which should not pose a significant health risk. The level of personnel protection will be Level "D" protection, with a possible upgrade to Level "C".

8.2.2 Heat Stress

The heat stress load on the site workers will be assessed continuously by supervisors and the SHSO. Heat stress monitoring will not be performed if temperatures do not present any immediate health hazard.

The wearing of protective clothing in warm environments creates a heat stress potential. Some of the following control measures may be used to help control heat stress:

- o Provision of adequate liquids to replace lost body fluids
- o Availability of electrolyte replacement fluids for use
- o Establishment of a work regime to provide adequate rest periods for cooling down
- o Cool area designated as the rest area.

Some symptoms of heat exhaustion are clammy skin, light-headedness, slurred speech, rapid pulse, fatigue, confusion, fainting, and nausea. The following steps should be taken if a person shows signs of heat exhaustion:

1. Take the victim to a cooler, uncontaminated area
2. Remove protective clothing
3. Give water to drink, if conscious
4. Allow to rest.

Symptoms of heat stroke are similar to heat exhaustion and include hot skin (temperature rise), incoherence, mental confusion, convulsions and unconsciousness. If a person shows signs of heat stroke, follow the steps listed above and include these steps:

5. Cool the victim with water, cold compresses, and/or fanning
6. Transport the victim to a medical facility.

Heat stroke is a medical emergency!

Temperatures at or below freezing are not characteristic of this area and will not affect persons working outdoors.

8.2.3 General Safety Practices

The following general safety practices will be observed during sample plan implementation:

1. All personnel going to the site will be thoroughly briefed on the anticipated hazards, equipment requirements, safety practices, emergency procedures, and communication methods.
2. Medical evaluation of all personnel entering the site will be performed prior to project commencement to ensure that there are no preexisting conditions that would prevent personnel from wearing respiratory protection or performing the tasks required of their respective jobs.
3. Eating, chewing gum or tobacco, or taking medication will be prohibited in contaminated or potentially contaminated areas or where the possibility for transfer of contamination exists. Smoking will be prohibited in work zones throughout the site.
4. Thorough washing of hands will be required before eating and when leaving the work area.
5. The field crew will, to the extent possible, avoid contact with potentially contaminated surfaces. The field crew will also avoid, whenever possible, kneeling on the ground and leaning or sitting on drums, equipment, or ground. Monitoring equipment shall not be placed on potentially contaminated surfaces (e.g., drums, ground, etc.).
6. No beard or facial hair which interferes with a satisfactory qualitative respirator fit test will be allowed for field crew personnel requiring respiratory protection.
7. Personnel will be familiar with and knowledgeable about standard operating safety procedures for both equipment utilization and site considerations.
8. Personnel will be familiar with, knowledgeable about, and adhere to instructions in the SSP.
9. Consideration shall be made for fatigue, heat stress, and other environmental factors influencing the health of personnel.
10. Designated and approved respiratory protective devices and protective clothing shall be worn as instructed by the SHSO.

11. Sampling tools (shovels, trowels, etc.) shall be washed with detergent and water and rinsed well. Tool decontamination shall be performed on the site.

8.3 PERSONAL PROTECTION EQUIPMENT

Level "D" protection will be worn as long as there is not indication of the presence of airborne health hazards. If the SHSO determines that enough dust is generated to be considered a health hazard, an upgrade in respiratory protection equipment will be implemented. Personnel will carry Level "C" protective gear and be prepared to upgrade to this level if necessary.

Level D Personnel Protective Equipment

- o Coveralls
- o Gloves
- o Boots/shoes, leather or chemical-resistant, steel-toed
- o Safety glasses or chemical splash goggles
- o Hardhat
- o Dust respirator (available).

Criteria for Selection of Level D Protection

Meeting any of these criteria allows use of Level D protection:

- o No significant amount of dust generated during sampling operation.

Guidance on Selection Criteria

Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated and there are no inhalable toxic substances.

Level C Personnel Protective Equipment

- o Full-or half-face, air purifying, canister-equipped respirator with high efficiency particle filters (MSHA/NIOSH approved)
- o Tyvek Coveralls
- o Gloves (outer), chemical-resistant (taped to chemical-resistant clothing)

- o Boots (outer), chemical-resistant, steel toe and shank (taped to chemical-resistant clothing)
- o Eye Protection or face shield
- o Hardhat.

Criteria for Selection of Level C Protection

Meeting all of these criteria permits use of Level C protection:

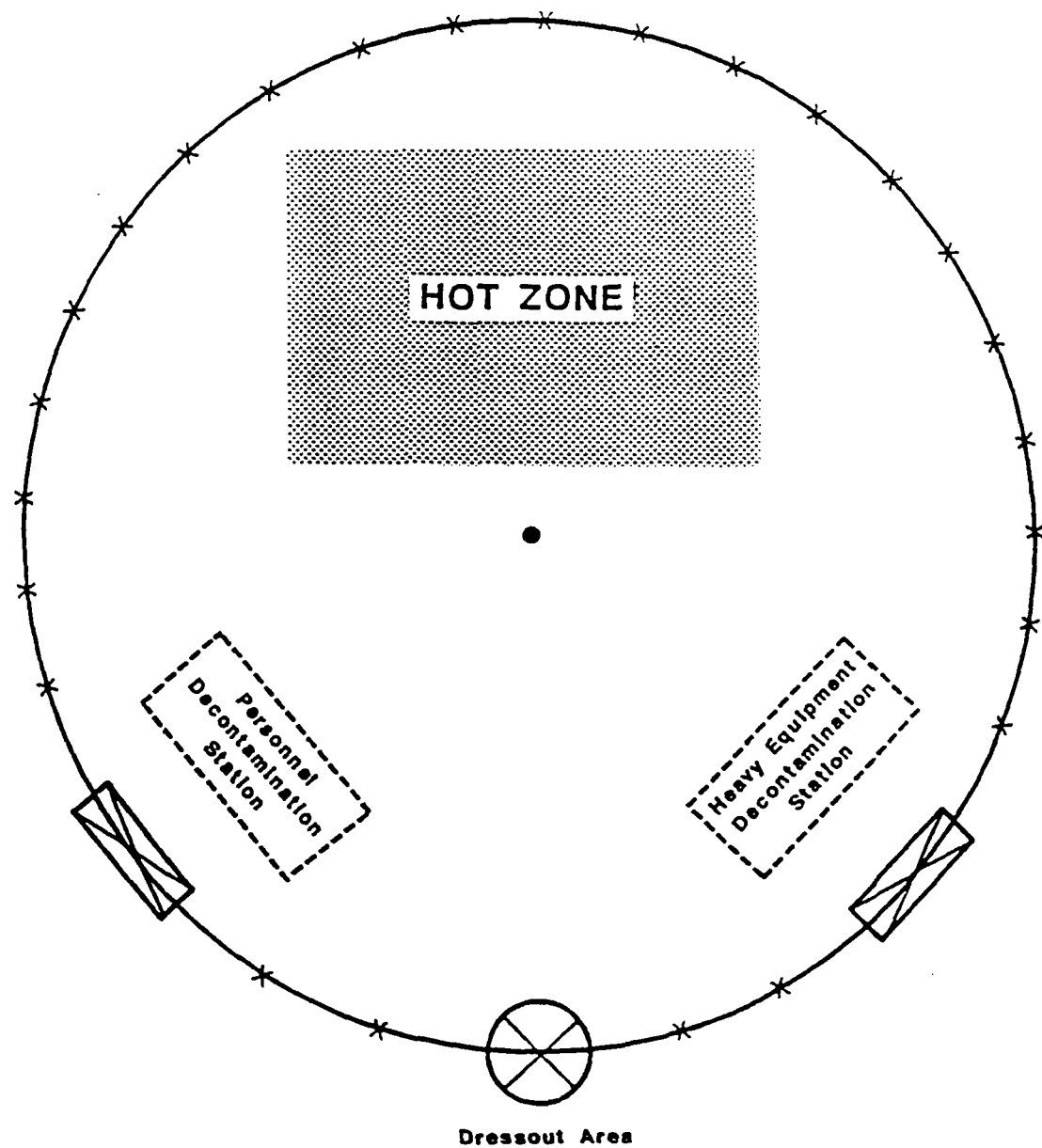
- o Physical presence of dross in noted or previous sampling data indicate dross exists
- o Measured air concentrations of identified substances will be reduced by the respirator to at, or below, the substance's exposure limit; and the concentration is within the service limit of the canister
- o Atmospheric contaminant concentrations do not exceed Immediately Dangerous to Life and Health (IDLH) levels
- o Atmospheric contaminants, or other direct contact will not adversely affect the small area of skin left unprotected by chemical-resistant clothing
- o Job functions have been determined to require no self-contained breathing apparatus.

8.4 DESIGNATION OF WORK AREAS AT THE SITE

If Level "C" protection is required, the site will be divided into two areas that will be designated as follows:

- o Exclusion Area, where contaminant exposure hazards exist and may require Level "C" protection
- o The Support Area, which is the remaining site area not requiring Level "C" protection.


The exclusion area or zone will consist of the area where sampling activities will be performed. The boundaries of the exclusion zone will be conspicuously marked with pylons and 2-inch OSHA compliance tape. Access to the exclusion zone will only be allowed to trained personnel who have read the SSP prepared for sampling activities and are wearing the correct level of protective equipment. Traffic will be restricted via controlled entrance and exit upwind of investigative activities. Figure 8-1 illustrates the exclusion zone set up and procedures.



Explanation:

- Center Point
- ⊗ Traffic Control Entrance
- ⊗ Traffic Control Exit
- x—x— Exclusion Boundary
- - - - - Decontamination Station Boundary

MS 03373

 The Earth Technology Corporation	Project No: 90-621 Chemonics
CONTAMINATION REDUCTION SYSTEM Figure 8-1	

10-90

8.5 PERSONNEL DECONTAMINATION PROCEDURES

The extent of decontamination will be adapted to site-specific conditions. The actual conditions may require more or less intensive effort. The toxicity of contaminants or hazardous risk expected will govern the degree of decontamination. Highly toxic or skin-destructive materials will require full decontamination procedures; less hazardous substances will call for fewer decontamination procedures.

Consideration will be given to the amount and location of contaminants on the protective clothing. Visual assessment will be the usual method of estimating the magnitude of risk. A thorough decontamination will generally be required if personal protective equipment is badly contaminated. Permeation or degradation of protective clothing could occur when hazardous substances remain on these surfaces for extended time periods. In addition, contamination on the upper areas of protective clothing could present a greater risk to the field personnel. Concentrations at this higher level could be more accessible to the breathing zone. There could also be an increased probability of skin contact when personnel doff the upper clothing. Therefore, minimizing overall contamination on protective equipment and clothing will be a constant goal during drilling activities.

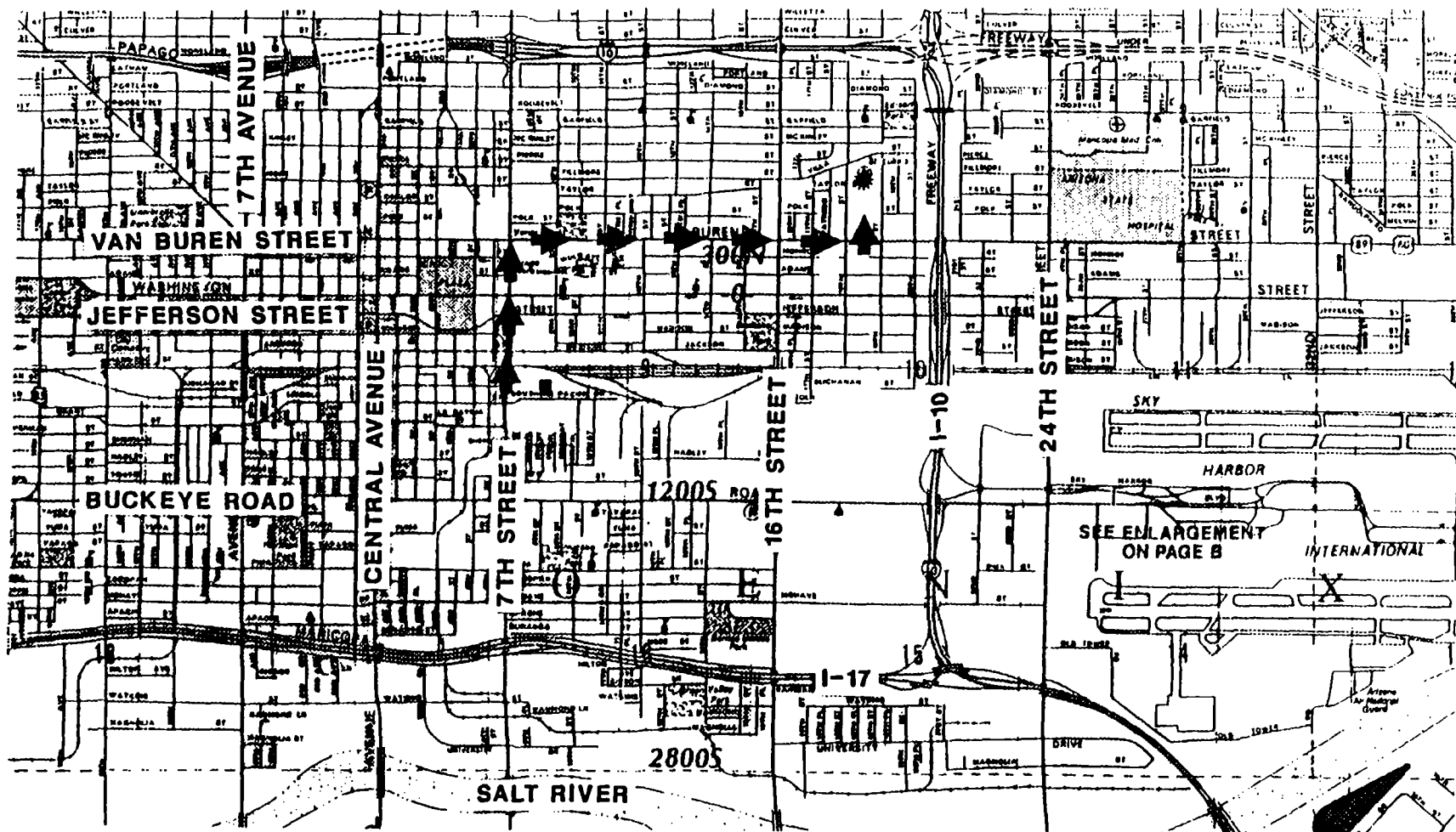
The type of work that each person will perform governs the potential for hazardous substance contact. Modification to decontamination protocol will be made on site as job functions dictate.

Personnel leaving the hot zone periodically may or may not need decontamination depending on their reason for leaving. For example, personnel leaving the hot zone to pick up or drop off tools and immediately returning may not require decontamination. An individual leaving to change respirator cartridges may require some degree of decontamination. However, personnel exiting the exclusion zone for a break, lunch, or at end of shift will be completely decontaminated.

8.6 EMERGENCY RESOURCES

The following emergency information will be available at the site of the sampling activities for appropriate use by site personnel.

Local Fire Department	911
Local Paramedic	911
Local Sheriff/Police	911
Local Medical Care	(602) 251-8183 St. Lukes Hospital 1800 E. Van Buren Phoenix, Arizona
Poison Center	253-3334 or 1-800-362-0101
Earth Technology Office Phil Lagas, Nick Hild	(602) 894-8482
Project Manager David Grisa	[REDACTED] (home) (602) 894-8482 (office).



Source: Wide World of Maps, 1990
 Reproduced by permission #900222-A

MS 03376

0 1
 SCALE IN MILES



The Earth Technology
 Corporation

Project No: 90-621
 Chamonics

ROUTE TO THE NEAREST HOSPITAL

Figure 8-2

APPENDIX C
LABORATORY ANALYTICAL RESULTS

Analytical**Technologies**, Inc.

2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 006565

June 26, 1990

The Earth Technology Corp.
2411 W. 14th Street
Suite 210
Tempe, AZ 85281

Project Name/Number: Chemonics 90-621

Attention: Dave Grisa

On 06/06/90, Analytical Technologies, Inc. received a request to analyze soil sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Due to low 8080 surrogate recovery, sample number CI-7 was reextracted and analyzed with good recovery.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure
90-19



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656501

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-1-1 7-6
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/90
DATE RECEIVED : 06/06/90
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/16/90
UNITS : MG/KG
DILUTION FACTOR : 2000

COMPOUNDS

RESULTS

ALDRIN	<10.0
ALPHA - BHC	78
BETA - BHC	16
GAMMA - BHC	43
DELTA - BHC	40
CHLORDANE	<100
4,4'-DDD	780
4,4'-DDE	21
4,4'-DDT	490
DIELDRIN	<20
ENDOSULFAN I	<20
ENDOSULFAN II	<20
ENDOSULFAN SULFATE	<20
ENDRIN	<20
ENDRIN ALDEHYDE	<20
ENDRIN KETONE	<20
HEPTACHLOR	<10.0
HEPTACHLOR EPOXIDE	<10.0
METHOXYCHLOR	<100
TOXAPHENE	<200
AROCLOR 1016	<100
AROCLOR 1221	<100
AROCLOR 1232	<100
AROCLOR 1242	<100
AROCLOR 1248	<100
AROCLOR 1254	<100
AROCLOR 1260	<100

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656502

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-1-2
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/9
DATE RECEIVED : 06/06/9
DATE EXTRACTED : 06/08/9
DATE ANALYZED : 06/14/9
UNITS : MG/KG
DILUTION FACTOR : 100

COMPOUNDS

RESULTS

ALDRIN	<0.50
ALPHA - BHC	5.4
BETA - BHC	0.47
GAMMA - BHC	13
DELTA - BHC	3.2
CHLORDANE	<5.0
4,4'-DDD	<1.0
4,4'-DDE	<1.0
4,4'-DDT	3.7
DIELDRIN	<1.0
ENDOSULFAN I	<1.0
ENDOSULFAN II	<1.0
ENDOSULFAN SULFATE	<1.0
ENDRIN	<1.0
ENDRIN ALDEHYDE	<1.0
ENDRIN KETONE	<1.0
HEPTACHLOR	<0.50
HEPTACHLOR EPOXIDE	<0.50
METHOXYCHLOR	<5.0
TOXAPHENE	<10
AROCLOR 1016	<5.0
AROCLOR 1221	<5.0
AROCLOR 1232	<5.0
AROCLOR 1242	<5.0
AROCLOR 1248	<5.0
AROCLOR 1254	<5.0
AROCLOR 1260	<5.0

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656503

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-1-3
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/90
DATE RECEIVED : 06/06/90
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/15/90
UNITS : MG/KG
DILUTION FACTOR : 10

COMPOUNDS

RESULTS

ALDRIN	<0.050
ALPHA - BHC	0.12
BETA - BHC	<0.050
GAMMA - BHC	0.28
DELTA - BHC	0.22
CHLORDANE	<0.5
4,4'-DDD	<0.1
4,4'-DDE	<0.1
4,4'-DDT	<0.1
DIELDRIN	<0.1
ENDOSULFAN I	<0.1
ENDOSULFAN II	<0.1
ENDOSULFAN SULFATE	<0.1
ENDRIN	<0.1
ENDRIN ALDEHYDE	<0.1
ENDRIN KETONE	<0.1
HEPTACHLOR	<0.050
HEPTACHLOR EPOXIDE	<0.050
METHOXYCHLOR	<0.5
TOXAPHENE	<1.0
AROCLOR 1016	<0.5
AROCLOR 1221	<0.5
AROCLOR 1232	<0.5
AROCLOR 1242	<0.5
AROCLOR 1248	<0.5
AROCLOR 1254	<0.5
AROCLOR 1260	<0.5

SURROGATE PERCENT RECOVERIES

DBC (%)

85



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656504

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT	: EARTH TECHNOLOGY	DATE SAMPLED	: 06/06/9
PROJECT #	: 90-621	DATE RECEIVED	: 06/06/9
PROJECT NAME	: CHEMONICS	DATE EXTRACTED	: 06/08/9
CLIENT I.D.	: CI-2-1	DATE ANALYZED	: 06/16/9
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 200

COMPOUNDS	RESULTS
ALDRIN	<1.00
ALPHA - BHC	<1.00
BETA - BHC	1.1
GAMMA - BHC	<1.00
DELTA - BHC	<1.00
CHLORDANE	<10.0
4,4'-DDD	7.8
4,4'-DDE	9.5
4,4'-DDT	8.7
DIELDRIN	<2.0
ENDOSULFAN I	<2.0
ENDOSULFAN II	<2.0
ENDOSULFAN SULFATE	<2.0
ENDRIN	<2.0
ENDRIN ALDEHYDE	<2.0
ENDRIN KETONE	<2.0
HEPTACHLOR	<1.00
HEPTACHLOR EPOXIDE	<1.00
METHOXYCHLOR	<10.0
TOXAPHENE	<20
AROCLOR 1016	<10.0
AROCLOR 1221	<10.0
AROCLOR 1232	<10.0
AROCLOR 1242	<10.0
AROCLOR 1248	<10.0
AROCLOR 1254	<10.0
AROCLOR 1260	<10.0

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656505

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT	: EARTH TECHNOLOGY	DATE SAMPLED	: 06/06/90
PROJECT #	: 90-621	DATE RECEIVED	: 06/06/90
PROJECT NAME	: CHEMONICS	DATE EXTRACTED	: 06/08/90
CLIENT I.D.	: CI-2-2	DATE ANALYZED	: 06/15/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ALDRIN	<0.005
ALPHA - BHC	0.0064
BETA - BHC	0.027
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	0.016
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%)	91
---------	----



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656506

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-2-3
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/9
DATE RECEIVED : 06/06/9
DATE EXTRACTED : 06/08/9
DATE ANALYZED : 06/15/9
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

ALDRIN	<0.005
ALPHA - BHC	<0.005
BETA - BHC	0.0065
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	<0.01
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%)

92

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656507

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-3-1
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/90
DATE RECEIVED : 06/06/90
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/01/90
UNITS : MG/KG
DILUTION FACTOR : 5

COMPOUNDS

RESULTS

ALDRIN	<0.025
ALPHA - BHC	<0.025
BETA - BHC	0.041
GAMMA - BHC	<0.025
DELTA - BHC	<0.025
CHLORDANE	<0.25
4,4'-DDD	0.16
4,4'-DDE	0.15
4,4'-DDT	0.13
DIELDRIN	<0.05
ENDOSULFAN I	<0.05
ENDOSULFAN II	<0.05
ENDOSULFAN SULFATE	<0.05
ENDRIN	<0.05
ENDRIN ALDEHYDE	<0.05
ENDRIN KETONE	<0.05
HEPTACHLOR	<0.025
HEPTACHLOR EPOXIDE	<0.025
METHOXYCHLOR	<0.25
TOXAPHENE	0.99
AROCLOR 1016	<0.25
AROCLOR 1221	<0.25
AROCLOR 1232	<0.25
AROCLOR 1242	<0.25
AROCLOR 1248	<0.25
AROCLOR 1254	<0.25
AROCLOR 1260	<0.25

SURROGATE PERCENT RECOVERIES

DBC (%)

113



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656508

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-3-2
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/90
DATE RECEIVED : 06/06/90
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/15/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
ALDRIN	<0.005
ALPHA - BHC	<0.005
BETA - BHC	<0.005
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	<0.01
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%)

89

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656509

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-3-3
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/90
DATE RECEIVED : 06/06/90
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/15/90
UNITS : MG/KG
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
ALDRIN	<0.005
ALPHA - BHC	<0.005
BETA - BHC	<0.005
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	<0.01
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%) 105



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656510

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-4
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/9
DATE RECEIVED : 06/06/9
DATE EXTRACTED : 06/08/9
DATE ANALYZED : 06/16/9
UNITS : MG/KG
DILUTION FACTOR : 500

COMPOUNDS

RESULTS

ALDRIN	<2.50
ALPHA - BHC	<2.50
BETA - BHC	<2.50
GAMMA - BHC	<2.50
DELTA - BHC	<2.50
CHLORDANE	<25.0
4,4'-DDD	<5.0
4,4'-DDE	59
4,4'-DDT	23
DIELDRIN	7.0
ENDOSULFAN I	<5.0
ENDOSULFAN II	<5.0
ENDOSULFAN SULFATE	<5.0
ENDRIN	<5.0
ENDRIN ALDEHYDE	<5.0
ENDRIN KETONE	<5.0
HEPTACHLOR	<2.50
HEPTACHLOR EPOXIDE	<2.50
METHOXYCHLOR	<25.0
TOXAPHENE	130
AROCLOR 1016	<25.0
AROCLOR 1221	<25.0
AROCLOR 1232	<25.0
AROCLOR 1242	<25.0
AROCLOR 1248	<25.0
AROCLOR 1254	<25.0
AROCLOR 1260	<25.0

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656511

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT	: EARTH TECHNOLOGY	DATE SAMPLED	: 06/06/9
PROJECT #	: 90-621	DATE RECEIVED	: 06/06/9
PROJECT NAME	: CHEMONICS	DATE EXTRACTED	: 06/08/9
CLIENT I.D.	: CI-5	DATE ANALYZED	: 06/14/9
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 100

COMPOUNDS	RESULTS
-----------	---------

ALDRIN	<0.50
ALPHA - BHC	<0.50
BETA - BHC	<0.50
GAMMA - BHC	<0.50
DELTA - BHC	<0.50
CHLORDANE	<5.0
4,4'-DDD	4.1
4,4'-DDE	2.6
4,4'-DDT	3.6
DIELDRIN	<1.0
ENDOSULFAN I	<1.0
ENDOSULFAN II	<1.0
ENDOSULFAN SULFATE	<1.0
ENDRIN	<1.0
ENDRIN ALDEHYDE	<1.0
ENDRIN KETONE	<1.0
HEPTACHLOR	<0.50
HEPTACHLOR EPOXIDE	<0.50
METHOXYCHLOR	<5.0
TOXAPHENE	10
AROCLOR 1016	<5.0
AROCLOR 1221	<5.0
AROCLOR 1232	<5.0
AROCLOR 1242	<5.0
AROCLOR 1248	<5.0
AROCLOR 1254	<5.0
AROCLOR 1260	<5.0

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable



GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656512

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-6
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/9
DATE RECEIVED : 06/06/9
DATE EXTRACTED : 06/08/9
DATE ANALYZED : 06/14/9
UNITS : MG/KG
DILUTION FACTOR : 100

COMPOUNDS	RESULTS
ALDRIN	<0.50
ALPHA - BHC	<0.50
BETA - BHC	<0.50
GAMMA - BHC	<0.50
DELTA - BHC	<0.50
CHLORDANE	<5.0
4,4'-DDD	3.4
4,4'-DDE	8.3
4,4'-DDT	4.2
DIELDRIN	<1.0
ENDOSULFAN I	<1.0
ENDOSULFAN II	<1.0
ENDOSULFAN SULFATE	<1.0
ENDRIN	<1.0
ENDRIN ALDEHYDE	<1.0
ENDRIN KETONE	<1.0
HEPTACHLOR	<0.50
HEPTACHLOR EPOXIDE	<0.50
METHOXYCHLOR	<5.0
TOXAPHENE	13
AROCLOR 1016	<5.0
AROCLOR 1221	<5.0
AROCLOR 1232	<5.0
AROCLOR 1242	<5.0
AROCLOR 1248	<5.0
AROCLOR 1254	<5.0
AROCLOR 1260	<5.0

SURROGATE PERCENT RECOVERIES

DBC (%)

**

** Due to the necessary dilution of the sample, result was not attainable

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 00656513

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : CI-7
SAMPLE MATRIX : SOIL

DATE SAMPLED : 06/06/9
DATE RECEIVED : 06/06/9
DATE EXTRACTED : 06/19/9
DATE ANALYZED : 06/22/9
UNITS : MG/KG
DILUTION FACTOR : 200

COMPOUNDS	RESULTS
ALDRIN	<1.00
ALPHA - BHC	<1.00
BETA - BHC	<1.00
GAMMA - BHC	<1.00
DELTA - BHC	<1.00
CHLORDANE	<10.0
4,4'-DDD	3.7
4,4'-DDE	33
4,4'-DDT	3.6
DIELDRIN	<2.0
ENDOSULFAN I	<2.0
ENDOSULFAN II	<2.0
ENDOSULFAN SULFATE	<2.0
ENDRIN	<2.0
ENDRIN ALDEHYDE	<2.0
ENDRIN KETONE	<2.0
HEPTACHLOR	<1.00
HEPTACHLOR EPOXIDE	<1.00
METHOXYCHLOR	<10.0
TOXAPHENE	<20
AROCLOR 1016	<10.0
AROCLOR 1221	<10.0
AROCLOR 1232	<10.0
AROCLOR 1242	<10.0
AROCLOR 1248	<10.0
AROCLOR 1254	<10.0
AROCLOR 1260	<10.0

SURROGATE PERCENT RECOVERIES

DBC (%) 114



GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 006565
DATE EXTRACTED : 06/08/9
DATE ANALYZED : 06/14/9
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
ALDRIN	<0.005
ALPHA - BHC	<0.005
BETA - BHC	<0.005
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	<0.01
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%)

88



GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY
PROJECT # : 90-621
PROJECT NAME : CHEMONICS
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 006565
DATE EXTRACTED : 06/08/90
DATE ANALYZED : 06/14/90
UNITS : MG/KG
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
ALDRIN	<0.005
ALPHA - BHC	<0.005
BETA - BHC	<0.005
GAMMA - BHC	<0.005
DELTA - BHC	<0.005
CHLORDANE	<0.05
4,4'-DDD	<0.01
4,4'-DDE	<0.01
4,4'-DDT	<0.01
DIELDRIN	<0.01
ENDOSULFAN I	<0.01
ENDOSULFAN II	<0.01
ENDOSULFAN SULFATE	<0.01
ENDRIN	<0.01
ENDRIN ALDEHYDE	<0.01
ENDRIN KETONE	<0.01
HEPTACHLOR	<0.005
HEPTACHLOR EPOXIDE	<0.005
METHOXYCHLOR	<0.05
TOXAPHENE	<0.1
AROCLOR 1016	<0.05
AROCLOR 1221	<0.05
AROCLOR 1232	<0.05
AROCLOR 1242	<0.05
AROCLOR 1248	<0.05
AROCLOR 1254	<0.05
AROCLOR 1260	<0.05

SURROGATE PERCENT RECOVERIES

DBC (%)

94



QUALITY CONTROL DATA

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

ATI I.D. : 006565

CLIENT : EARTH TECHNOLOGY

PROJECT # : 90-621

PROJECT NAME : CHEMONICS

REF I.D. : 00656503

DATE ANALYZED : 06/19/90

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RI
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
GAMMA BHC	0.28	0.067	*	*	*	*	*
HEPTACHLOR	<0.05	0.067	0.056	84	0.060	90	7
ALDRIN	<0.05	0.067	0.054	81	0.053	79	2
DIELDRIN	<0.1	0.067	0.064	96	0.070	104	9
ENDRIN	<0.1	0.067	0.064	96	0.065	97	2
DDT	<0.1	0.067	0.066	99	0.075	112	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

* Result out of limits due to sample matrix interference



QUALITY CONTROL DATA

ATI I.D. : 006565

TEST : ORGANOCHLORINE PESTICIDES/PCB'S (EPA 8080)

CLIENT : EARTH TECHNOLOGY

PROJECT # : 90-621

PROJECT NAME : CHEMONICS

REF I.D. : 00656509

DATE ANALYZED : 06/15/90

SAMPLE MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPI
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
GAMMA BHC	<0.005	0.067	0.057	85	0.057	85	0
HEPTACHLOR	<0.005	0.067	0.060	90	0.061	91	2
ALDRIN	<0.005	0.067	0.057	85	0.057	85	0
DIELDRIN	<0.01	0.067	0.068	101	0.070	104	3
ENDRIN	<0.01	0.067	0.067	100	0.060	90	11
DDT	<0.005	0.067	0.074	110	0.072	107	3

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$